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<110> Katz, Leonard
Reid, Ralph C.
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Schirmer, Andreas
Ward, Shannon L.
Reeves, Christopher

<120> RECOMBINANT CHALCOMYCIN POLYKETIDE
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<150> US 60/420,994

<151> 2002-10-24

<150> US 60/493,966

<151> 2003-08-08

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<211> 343

<212> PRT

<213> Streptomyces bikiniensis

<400> 2

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Leu Gly Leu Met Gly Arg Leu Val Val Glu Gly Val Val Val Thr Pro
 35             40             45
Ile Trp Pro Pro Thr Gly Val Ala Val Ala Ala Leu Leu Leu Leu Gly
 50             55             60

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Thr	Val	Ala	Pro	Leu	Cys	Ala	Phe	Leu	Leu	Thr	Arg	Ala	Gly	Phe	
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Leu	Leu	Leu	Val	Leu	Ala	Gly	Pro	Ala	Gly	Arg	Phe	Arg	Val	Arg	Arg
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Trp	Lys	Glu	Ala	Ala	Leu	Leu	Gly	Leu	Ala	Thr	Leu	Ile	Leu	Met	Pro
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Glu	Leu	Ala	Glu	Val	Leu	Glu	His	Leu	Ala	Ala	Gly	Glu	Pro	Ala	Pro
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Gly	Pro	Pro	Gly	Thr	Ala	Glu	Ser	Arg	Ala	Ala	Pro	Ser	Gly	Gly	Pro
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<211> 279

<212> PRT

<213> Streptomyces bikiniensis

<400> 3

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Asp	Leu	Pro	Ser	Leu	Pro	Gly	Ala	Arg	Leu	Ala	Val	Arg	Tyr	Glu	Pro
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Ala	Asn	His	Gly	Leu	Asn	Val	Gly	Gly	Asp	Trp	Tyr	Asp	Ala	Phe	Pro
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Leu	Pro	Gly	Gly	Arg	Ile	Gly	Met	Ser	Ile	Gly	Asp	Val	Gln	Gly	His
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Asn	Ile	Glu	Ala	Ala	Ala	Phe	Met	Gly	Gln	Val	Arg	Val	Ala	Leu	Arg

Pro Ile Ala Arg Gly Ala Leu Ala Ala Gly Gly Ser Pro Val Ala Asp
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 Ile Ala Thr Glu Leu Glu Val Ser Ala Gly Gln Val Ala Leu Ala Trp
 225 230 235 240
 Leu Leu His Arg Ser Pro Ala Val Ile Pro Ile Pro Gly Thr Ser Ser
 245 250 255
 Pro Ala His Leu Arg Glu Asn Val Ala Ala Ser Gly Ile Ala Leu Ser
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 Asp Gly Gln Leu Ala Arg Leu Asn Ala Leu Gly Arg Thr His Asp Asp
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 Ala Thr Val Pro Val
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<210> 5

<211> 405

<212> PRT

<213> Streptomyces bikiniensis

<400> 5

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 35 40 45
 Leu Thr Asn Gly Gly Pro Leu Ala Arg Glu Phe Glu Gln Arg Val Ala
 50 55 60
 Glu Leu Ala Gly Val Arg Tyr Cys Val Ser Thr Cys Asn Ala Thr Val
 65 70 75 80
 Ala Leu Gln Leu Leu Ala Arg Ala Ala Asp Leu Ser Gly Glu Val Ile
 85 90 95
 Met Pro Ser Leu Thr Phe Pro Ala Thr Ala Gln Ala Phe Arg Trp Leu
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 Gly Leu Thr Pro Val Phe Val Asp Ile Asp Pro Ala Thr Asn Cys Leu
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 Asp Pro Asp Leu Ile Glu Ala Ala Ile Thr Pro Arg Thr Ser Ala Val
 130 135 140
 Val Pro Val His Leu Trp Gly Arg Pro Cys Ala Val Asp Arg Leu Ala
 145 150 155 160
 Lys Val Ala Ala Asp His Gly Leu Arg Leu Phe Tyr Asp Ala Ala His
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 Gly Leu Gly Cys Thr Ser Glu Gly Gln Pro Ile Gly Gly Phe Gly Gln
 180 185 190
 Ala Glu Val Phe Ser Phe His Ala Thr Lys Val Val Asn Ala Phe Glu
 195 200 205
 Gly Gly Ala Val Val Thr Asp Asp Glu Arg Leu Ala Gln Arg Val Arg
 210 215 220
 Ala Met His Asn Phe Gly Phe Thr Gln Gly Arg Val Ser Thr Glu Thr
 225 230 235 240
 Gly Thr Asn Gly Lys Met Thr Glu Ala Ala Ala Met Gly Leu Thr
 245 250 255
 Ser Leu Asp Ala Phe Glu Glu Thr Val Arg Arg Asn Glu Ala Asn His
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 Asp Asp Tyr Arg Ser Glu Leu Ala Gly Leu Ala Gly Leu Lys Val Met
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 Glu Phe Asp Arg Ala Glu Arg Asn Asn Tyr His Tyr Leu Val Val Glu

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Val Asp Ala Ala Val Thr Gly Val His Arg Asp Leu Leu Asp Glu Val				
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Leu Arg Ala Glu Asn Ile Met Cys Gln Arg Tyr Phe Ser Pro Gly Cys				
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His Glu Met Glu Pro Tyr Arg Ser Glu Arg Pro Val Ser Leu Pro His				
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Thr Glu Arg Leu Ala Arg Lys Val Leu Ala Leu Pro Thr Gly Pro Thr				
	355		360	
Val Ser Arg Glu Asp Ile Arg Arg Val Cys Asp Ile Val Arg Leu Thr				
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Leu Glu Arg Gly His Glu Val Thr Arg Arg Ala Asp Glu Arg Val Pro				
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Ser Thr Thr Ala Pro				400
	405			

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<211> 259

<212> PRT

<213> Streptomyces bikiniensis

<400> 6

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Pro Gly Ala Glu Gly Pro Asp Val Glu Arg Gly Thr Phe Asp Ala Asp				
	35		40	
His Arg Ala Glu Gly Leu Asp Val Pro Thr Val Ala His Thr Met Ile				
	50		55	
Gly Leu Gln Arg Leu Asp Asn Ile Gln Arg Cys Val Glu Arg Val Leu				
65		70		75
Gln Asp Asp Val Pro Gly Asp Leu Ile Glu Thr Gly Val Trp Arg Gly				
	85		90	
Gly Ala Cys Ile Leu Met Arg Ala Leu Leu Lys Ala His Gly Val Glu				
	100		105	
Asp Arg Thr Val Trp Leu Ala Asp Ser Phe Ala Gly Val Pro Val Thr				
	115		120	
Ser Glu Asp Ser His Pro Leu Asp Arg Ala Met Glu Phe His His Leu				
	130		135	
Asn Trp Val Leu Ser Cys Ser Glu Glu Gln Val Arg Glu Asn Phe Ala				
145		150		155
Arg Tyr Gly Leu Leu Asp Glu Gln Val Arg Phe Leu Pro Gly Met Phe				
	165		170	
Ala Asp Thr Leu Pro Thr Ala Pro Ile Asp Arg Leu Ala Val Leu Arg				
	180		185	
Val Asp Gly Asp Leu Tyr Glu Ser Thr Arg Asp Ala Leu Val Asn Leu				
	195		200	
Tyr Pro Lys Leu Ser Val Gly Gly Phe Val Ile Val Asp Asp Tyr Leu				
	210		215	
Ile Pro Ala Cys Lys Gln Ala Val His Asp Tyr Arg Ser Glu His Gly				
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Arg Glu His				255

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 <211> 485
 <212> PRT
 <213> Streptomyces bikiniensis

<400> 7

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Arg	Arg	Leu	Val	Arg	Leu	Ala	Glu	Arg	Tyr	Gly	Asn	His	Pro	Phe	Thr
		50				55					60				
Pro	Leu	Glu	Glu	Ala	Arg	Arg	Met	Leu	Asp	Val	Asp	Arg	Ala	Ser	Phe
65					70				75					80	
Gly	Arg	Leu	Leu	Gly	Leu	Phe	Gly	Arg	Val	Pro	Glu	Leu	Arg	His	Ala
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Val	Glu	Asn	Gly	Pro	Ala	Gly	Lys	Tyr	Trp	Gln	Asn	Thr	Leu	Leu	Pro
			100					105					110		
Leu	Glu	Arg	Arg	Gly	Val	Phe	Asp	Ala	Ala	Leu	Ala	His	Lys	Pro	Ala
		115					120					125			
Phe	Pro	Tyr	Val	Val	Gly	Leu	Tyr	Pro	Gly	Pro	Ser	Cys	Met	Phe	Arg
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Cys	His	Phe	Cys	Val	Arg	Val	Thr	Gly	Ala	Arg	Tyr	Asp	Pro	Ser	Ala
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Ala	Gly	Asn	Pro	Tyr	Ala	Met	Tyr	Phe	Ser	Gly	Gly	Leu	Glu	Pro	Leu
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Thr	Asn	Pro	Gly	Leu	Gly	Ala	Leu	Ser	Ser	Arg	Ala	Ala	Ala	Arg	Gly
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Leu	Arg	Pro	Thr	Val	Tyr	Thr	Asn	Ser	Phe	Ala	Leu	Thr	Glu	Arg	Thr
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Leu	Asp	Arg	Gln	Pro	Gly	Val	Trp	Asp	Leu	His	Ala	Val	Arg	Thr	Ser
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Met	Arg	Arg	Ser	Ala	His	Pro	Gln	Val	Ser	Val	Gln	Val	Asp	Leu	Leu

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			420					425					430		
Glu	Val	Val	Glu	Arg	Phe	Val	Asp	Asp	Gly	Arg	Leu	Ile	Ala	Pro	His
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Ala	Gly	Asp	Glu	Tyr	Phe	Met	Asp	Gly	Phe	Asp	Gln	Val	Val	Ala	Ala
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Arg	Leu	Asn	Gln	Leu	Glu	Ala	Asp	Val	Val	Ala	Gly	Trp	Glu	Asp	Ala
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				485											

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<212> PRT

<213> Streptomyces bikiniensis

<400> 8

Met	Arg	Thr	Ala	Thr	Ser	Ala	Glu	Arg	Thr	Ser	Val	Ser	Met	Leu	Phe
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Gly	Thr	Thr	Arg	Thr	Gly	Arg	Arg	Ile	Arg	Arg	Thr	Val	Gly	Ser	Ala
			20					25				30			
Leu	Ala	Ala	Leu	Cys	Val	Gly	Gly	Leu	Leu	Thr	Ala	Pro	Ser	Ala	Ala
		35				40				45					
Gly	Ala	Pro	Ala	Ala	Glu	Pro	Gly	Thr	Ala	Arg	Val	Arg	Gly	Leu	Val
	50					55				60					
Ala	Lys	Met	Thr	Leu	Asp	Glu	Lys	Ile	Ser	Phe	Val	His	Trp	Thr	Thr
65				70					75					80	
Gly	Pro	Val	Gly	Gly	Pro	Thr	Met	Thr	Gly	Ile	Gly	Tyr	Leu	Pro	Gly
			85					90					95		
Val	Pro	Arg	Leu	Gly	Ile	Pro	Glu	Leu	Arg	Thr	Ala	Asp	Gly	Pro	Val
			100				105					110			
Gly	Ile	Arg	Leu	Leu	Gly	Gly	Thr	Ala	Thr	Ala	Met	Pro	Thr	Pro	Val
	115					120					125				
Ala	Leu	Ala	Ala	Thr	Phe	Asp	Glu	Arg	Leu	Ala	Glu	Glu	Tyr	Gly	Thr
	130				135					140					
Val	Leu	Gly	Arg	Glu	Gly	Arg	Ala	Leu	Gly	Gln	Asp	Ile	Val	Leu	Gly
145				150					155					160	
Pro	Met	Thr	Asn	Val	Ile	Arg	Val	Pro	His	Ala	Gly	Arg	Asn	Phe	Glu
			165					170					175		
Thr	Tyr	Ser	Glu	Asp	Pro	Leu	Leu	Ser	Arg	Met	Ala	Ala	His	Glu	
			180				185				190				
Val	Arg	Gly	Ile	Gln	Asn	Gln	Gly	Leu	Met	Ala	Thr	Val	Lys	His	Phe
	195					200					205				
Ala	Ala	Asn	Asn	Gln	Glu	Tyr	Gln	Arg	Glu	Thr	Ile	Asp	Ala	Val	Val
	210				215					220					
Asp	Glu	Gln	Thr	Leu	Gln	Glu	Val	Glu	Leu	Pro	Ala	Phe	Arg	Ser	Ala
225				230				235						240	
Val	Arg	Ala	Gly	Ala	Ala	Ser	Val	Met	Cys	Ser	Tyr	Asn	Lys	Val	Asn
			245					250					255		
Gly	Ala	His	Ala	Cys	Gly	Asn	Glu	His	Leu	Leu	Gln	Glu	Val	Leu	Arg
		260				265					270				
Glu	Gln	Trp	Asp	Phe	Arg	Gly	Trp	Val	Val	Ser	Asp	Trp	Leu	Ala	Thr
	275					280						285			

His	Ala	Thr	Gly	Asp	Ile	Thr	Arg	Gly	Leu	Asp	Gln	Glu	Leu	Gly	Val	290	295	300
Glu	Leu	Thr	Leu	Gly	Gln	Pro	Val	Pro	Glu	Ser	Lys	Tyr	Phe	Ser	Ser	305	310	315
Ala	Leu	Arg	Ala	Ala	Val	Arg	Asp	Gly	Ser	Val	Pro	Glu	Ala	Thr	Leu	320	325	330
Asp	Arg	Ser	Val	Val	Arg	Ile	Leu	Gly	Gln	Met	Glu	Arg	Phe	Gly	Leu	335	340	345
Leu	Asp	Gly	Lys	Ala	Thr	Glu	Arg	Pro	Gln	Arg	Asp	Pro	Glu	Ala	Gly	350	355	360
Arg	Ala	Ala	Ala	Arg	Thr	Ile	Ala	Glu	Asn	Gly	Gly	Val	Leu	Leu	Arg	365	370	375
Asn	Glu	Arg	Arg	Thr	Leu	Pro	Leu	Thr	Gly	Glu	Asp	Ala	Thr	Asp	Ile	380	385	390
Ala	Val	Ile	Gly	Asn	Ser	Ala	Lys	His	Pro	Lys	Val	Thr	Gly	Asn	Gly	395	400	405
Ser	Ala	His	Val	Ile	Pro	Asp	Arg	Ala	Thr	Ala	Pro	Val	Asp	Ala	Leu	410	415	420
Ala	Arg	Arg	Ala	Gly	Glu	Lys	Ala	Arg	Val	Val	His	Glu	Pro	Gly	Glu	425	430	435
Asp	Leu	Val	Gly	Val	Pro	Val	Pro	Glu	Ser	Ser	Leu	Thr	Pro	Ala	Phe	440	445	450
Thr	Ser	Gly	Lys	Gln	Leu	Asp	Pro	Ser	Gly	Gln	Gly	Val	Phe	Tyr	Glu	455	460	465
Gly	Arg	Leu	Thr	Val	Pro	Ala	Asp	Gly	Asp	Tyr	Lys	Ile	Ala	Phe	Thr	470	475	480
Ala	Val	Gly	Gly	Val	Ala	Asn	Leu	Gln	Ile	Ala	Gly	Gln	Ser	Ala	Val	485	490	495
Leu	Gly	Thr	Glu	Ala	Phe	Gly	Thr	Val	Thr	Thr	Thr	Met	Arg	Leu	Thr	500	505	510
Arg	Gly	Thr	His	Ala	Val	Thr	Met	Asn	Gly	Trp	Ala	Phe	Glu	Gln	Thr	515	520	525
Pro	Leu	Ser	Val	Glu	Leu	Ser	Trp	Val	Thr	Pro	Glu	Ala	Ala	Arg	Asp	530	535	540
Asp	Phe	Asp	Arg	Ala	Val	Ala	Ala	Ala	Ala	Glu	Ala	Arg	Thr	Ala	Val	545	550	555
Val	Phe	Ala	His	Asp	Asp	Ser	Ala	Glu	Gly	Val	Asp	Arg	Ser	Ser	Leu	560	565	570
Ser	Leu	Pro	Gly	Arg	Gln	Asp	Glu	Leu	Ile	Ala	Ala	Ile	Thr	Lys	Val	575	580	585
Asn	Pro	Arg	Thr	Ile	Val	Val	Leu	Asn	Thr	Gly	Ser	Ser	Val	Leu	Met	590	595	600
Pro	Trp	Leu	Arg	Glu	Thr	Ala	Ala	Val	Leu	Glu	Met	Trp	Tyr	Pro	Gly	605	610	615
Gln	Glu	Gly	Ala	Glu	Ala	Thr	Ala	Ala	Leu	Leu	Phe	Gly	Asp	Ala	Asn	620	625	630
Pro	Ser	Gly	Arg	Leu	Thr	Gln	Thr	Phe	Pro	Ala	Thr	Glu	Thr	Gly	His	635	640	645
Pro	Met	Ala	Gly	Asp	Pro	His	Arg	Tyr	Pro	Gly	Val	Asp	Gly	Lys	Glu	650	655	660
Thr	Tyr	Ser	Glu	Gly	Leu	Asp	Val	Gly	Tyr	Arg	Trp	Tyr	Asp	Arg	Thr	665	670	675
Gly	Val	Ala	Pro	Leu	Phe	Pro	Phe	Gly	Tyr	Gly	Leu	Ser	Tyr	Thr	Thr	680	685	690
Phe	Ala	Tyr	Ser	Asp	Leu	Ser	Val	Ala	Arg	Thr	Ala	Arg	Gly	Leu	Glu	695	700	705
Ala	Thr	Val	Thr	Val	Arg	Asn	Thr	Gly	Asp	Arg	Ala	Gly	Arg	Glu	Thr	710	715	720
																725	730	735

Gln	Ala	Gly	Phe	Pro	Arg	Tyr	Ala	Thr	Glu	Asp	Val	Glu	Val	Gly	Gly
290						295					300				
Thr	Leu	Val	Arg	Ala	Gly	Asp	Pro	Val	Leu	Val	Gln	Met	Asn	Ala	Ala
305					310					315					320
Asn	Arg	Asp	Ala	Leu	Arg	Phe	Arg	Ser	Pro	Gly	Val	Leu	Asp	Ile	Thr
				325					330					335	
Arg	Asp	Asp	Ala	Gly	Arg	His	Leu	Gly	Tyr	Gly	His	Gly	Pro	His	His
			340					345					350		
Cys	Leu	Gly	Ala	Ser	Leu	Ala	Arg	Leu	Glu	Leu	Gln	Glu	Ala	Leu	Arg
		355					360					365			
Thr	Leu	Leu	Asp	Glu	Leu	Pro	Gly	Leu	His	Leu	Ala	Gln	Pro	Val	Glu
	370					375					380				
Trp	Lys	Thr	Glu	Met	Val	Val	Arg	Gly	Pro	Arg	Thr	Met	Leu	Val	Gly
385					390					395					400
Trp															

<210> 10

<211> 407

<212> PRT

<213> Streptomyces bikiniensis

<400> 10

Met	Thr	Ser	Ser	Cys	Pro	Val	His	Arg	Thr	Arg	Pro	Tyr	Pro	Phe	Ser
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Pro	Pro	Glu	Gly	Ile	Ala	Leu	Asp	Pro	Leu	Tyr	Ser	Arg	Leu	Arg	Glu
			20					25					30		
His	Glu	Pro	Val	Ser	Arg	Ile	Arg	Met	Pro	Tyr	Gly	Gly	Glu	Ala	Trp
		35					40					45			
Leu	Leu	Thr	Arg	His	Ala	Asp	Val	Arg	Ala	Val	Leu	Gly	Asp	Pro	Arg
	50					55					60				
Phe	Ser	Met	Glu	Ala	Gly	Ala	Gly	Arg	Asp	Val	Pro	Arg	Pro	Thr	Glu
65					70				75						80
Tyr	Pro	Leu	Pro	Ala	Gly	Gly	Leu	Ile	Ser	Met	Asp	Pro	Pro	Gly	His
				85					90					95	
Thr	Arg	Leu	Arg	Arg	Leu	Ala	Gly	Lys	Ala	Phe	Thr	Ala	Arg	Arg	Val
			100					105					110		
Glu	Glu	Leu	Arg	Pro	Arg	Val	Ser	Arg	Phe	Thr	Asp	Glu	Leu	Leu	Asp
		115					120					125			
Gly	Met	Val	Ala	Arg	Asp	Glu	Pro	Ser	Gly	Glu	Val	Met	Glu	Asp	Leu
	130					135					140				
Ala	Leu	Pro	Val	Ser	Ile	Ser	Val	Ile	Cys	Gly	Leu	Leu	Gly	Val	Ser
145					150				155						160
Tyr	Asp	Asp	Arg	His	Leu	Phe	Arg	Asp	Phe	Ser	Glu	Ala	Leu	Val	Ser
				165					170					175	
Ser	Ser	Leu	Gly	Pro	Ala	Glu	Val	Gln	Arg	Ala	Thr	Glu	Asp	Phe	Ser
			180					185					190		
Ala	Tyr	Met	Ala	Asp	Leu	Val	Ala	Asp	Arg	Arg	Ala	Arg	Pro	Thr	Asp
		195					200					205			
Asp	Phe	Leu	Ser	Thr	Met	Val	Gln	Ala	Arg	Asp	Glu	Gly	Asp	Arg	Leu
	210					215					220				
Ser	Glu	Ala	Glu	Leu	Leu	Met	Met	Gly	Ser	Gly	Leu	Leu	Ile	Ser	Gly
225					230					235					240
Tyr	Glu	Thr	Thr	Ala	Thr	Gln	Ile	Gly	Asn	Phe	Val	Leu	Leu	Leu	Leu
				245				250						255	

Asp	Asp	Arg	Arg	Leu	Tyr	Glu	Arg	Leu	Val	Thr	Glu	Pro	Asp	Leu	Val
			260					265					270		
Pro	Ser	Ala	Val	Glu	Glu	Leu	Leu	Arg	Phe	Thr	Pro	Leu	Ser	Thr	Leu
		275					280					285			
Asp	Gly	Phe	Ala	Arg	Ile	Ala	Leu	Glu	Asp	Val	Glu	Ile	Gly	Gly	Thr
	290					295					300				
Leu	Ile	Arg	Ala	Gly	Glu	Ala	Val	Ile	Thr	Ser	Ile	Ala	Ser	Ala	Asn
305				310						315					320
Leu	Asp	Asp	Thr	Ala	Phe	Pro	Gly	Ala	Ala	Ser	Leu	Asp	Leu	Ala	Arg
			325					330						335	
Ala	Gln	Asn	Pro	His	Leu	Gly	Phe	Gly	His	Gly	Ala	His	Tyr	Cys	Met
			340					345					350		
Gly	Ala	Pro	Leu	Ala	Arg	Leu	Glu	Leu	Gln	Val	Val	Leu	Ser	Thr	Leu
		355				360						365			
Val	Glu	Arg	Leu	Pro	Glu	Leu	Arg	Leu	Ser	Val	Pro	Ala	Ser	Glu	Leu
	370				375						380				
Arg	Trp	Arg	Ala	Gly	Ser	Leu	Leu	Arg	Thr	Pro	Glu	Ala	Val	Pro	Val
385				390						395					400
Thr	Trp	Gly	Gly	Ser	Ala	Ala									
				405											

<210> 11

<211> 282

<212> PRT

<213> Streptomyces bikiniensis

<400> 11

Met	Asn	Glu	Gly	Pro	Ala	Thr	Thr	Ala	Pro	Gly	Ser	Thr	Asn	Ala	Gly
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Asp	Leu	Trp	Leu	Arg	Arg	Tyr	Arg	Pro	Val	Ala	Asp	Pro	Ala	Leu	Arg
			20					25					30		
Leu	Val	Cys	Leu	Pro	His	Ala	Gly	Gly	Ser	Ala	Ser	Ala	Phe	Leu	Pro
		35				40						45			
Phe	Thr	Cys	Leu	Leu	Pro	Asp	Arg	Val	Glu	Val	Leu	Ala	Val	Gln	Tyr
	50					55					60				
Pro	Gly	Arg	Gln	Asp	Arg	Arg	Leu	Glu	Pro	Phe	Val	Asp	Ser	Val	Asp
65				70						75				80	
Ala	Leu	Val	Thr	His	Val	Ala	Gly	Ala	Leu	Gly	Pro	Trp	Leu	Asp	Arg
				85				90						95	
Pro	Val	Ala	Leu	Phe	Gly	His	Ser	Leu	Gly	Ser	Leu	Val	Ala	Phe	Glu
		100						105					110		
Thr	Ala	Arg	Arg	Leu	Ala	Glu	Gln	Ala	Pro	Glu	Ser	Arg	Leu	Ala	His
		115				120						125			
Leu	Phe	Val	Ser	Gly	Arg	Val	Ala	Pro	Thr	Val	Ala	His	Arg	Thr	Thr
	130					135					140				
Ala	His	Leu	Leu	Ser	Asp	Asp	Arg	Leu	Val	Ala	Lys	Leu	Ala	Glu	Leu
145				150						155				160	
Gln	Gly	Thr	Asp	Pro	Arg	Val	Leu	Ala	Asp	Glu	Glu	Val	Leu	Arg	Met
			165					170					175		
Ala	Leu	Pro	Ala	Ile	Arg	Asn	Asp	Tyr	Arg	Ala	Ala	Ala	Thr	Tyr	Thr
		180						185					190		
Trp	Arg	Pro	Gly	Ala	Pro	Leu	Ala	Cys	Pro	Ile	Thr	Val	Leu	Thr	Gly
		195				200						205			
Ser	Ala	Asp	Pro	His	Val	Pro	Thr	Asp	Gly	Ala	Leu	Ala	Trp	His	Gly
	210					215					220				
Leu	Thr	Thr	Gly	Glu	Thr	Ala	Phe	Arg	Ser	Phe	Pro	Gly	Gly	His	Phe

225					230					235					240
Tyr	Leu	Thr	Glu	Gln	Ala	Glu	Ala	Val	Cys	Arg	Thr	Ile	Arg	Thr	Ala
				245					250					255	
Thr	Gly	Leu	Ala	Val	Gly	Arg	Pro	His	Pro	Ser	Ser	Ser	Ala	Ala	Ala
			260					265					270		
Pro	Tyr	Asp	Arg	Glu	Ser	Val	His	Asp	Val						
		275					280								

<210> 12

<211> 323

<212> PRT

<213> Streptomyces bikiniensis

<400> 12

Met	Arg	Val	Leu	Val	Thr	Gly	Ala	Ala	Gly	Phe	Ile	Gly	Ser	His	Phe
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Val	Arg	Gln	Leu	Leu	Ser	Gly	Ser	Tyr	Pro	Glu	Leu	Ala	Gly	Ala	His
			20				25					30			
Val	Leu	Ser	Leu	Asp	Lys	Leu	Thr	Tyr	Ala	Gly	Asn	Thr	Glu	Asn	Leu
		35				40					45				
Ala	Glu	Val	Ala	Gly	His	Pro	Arg	His	Thr	Phe	Leu	His	Gly	Asp	Ile
	50				55				60						
Cys	Asp	Pro	Pro	Thr	Val	Ala	Gln	Ala	Leu	Arg	Gly	Thr	Asp	Leu	Val
65				70				75						80	
Val	His	Phe	Ala	Ala	Glu	Ser	His	Val	Asp	Arg	Ser	Ile	Thr	Asp	Ser
			85				90					95			
Ala	Ala	Phe	Val	Thr	Thr	Asn	Val	Leu	Gly	Thr	Gln	Thr	Leu	Leu	Arg
			100				105				110				
Ser	Ala	Leu	Glu	Ala	Gly	Val	Ser	Arg	Phe	Val	His	Val	Ser	Thr	Asp
		115				120					125				
Glu	Val	Tyr	Gly	Ser	Ile	Pro	Glu	Gly	Ser	Ser	Thr	Glu	Ala	Asp	Pro
	130			135			140								
Leu	Asp	Pro	Asn	Ser	Pro	Tyr	Ala	Ala	Ser	Lys	Ala	Ser	Ser	Asp	Leu
145				150			155							160	
Leu	Ala	Leu	Ala	Phe	His	Arg	Thr	His	Gly	Leu	Asp	Val	Arg	Val	Thr
			165				170				175				
Arg	Cys	Ser	Asn	Asn	Tyr	Gly	Pro	His	Gln	His	Pro	Glu	Lys	Val	Val
		180			185				190						
Pro	Leu	Phe	Val	Thr	His	Leu	Leu	Glu	Gly	Leu	Arg	Leu	Pro	Leu	Tyr
		195			200				205						
Gly	Asp	Gly	Leu	His	Arg	Arg	Asp	Trp	Leu	His	Val	Asp	Asp	His	Cys
	210			215			220								
Arg	Gly	Ile	Ala	Met	Val	Ala	Ala	Arg	Gly	Arg	Ala	Gly	Glu	Val	Tyr
225			230			235								240	
Asn	Ile	Gly	Gly	Gly	Thr	Glu	Leu	Ser	Asn	Val	Asp	Leu	Thr	Arg	Arg
			245			250								255	
Leu	Leu	Gly	Val	Phe	Gly	Ala	Asp	Trp	Ser	Val	Val	Asp	Arg	Val	Pro
		260			265							270			
Asp	Arg	Ala	Ala	His	Asp	Arg	Arg	Tyr	Cys	Val	Asp	Thr	Arg	Lys	Ile
		275			280				285						
Thr	Glu	Glu	Leu	Gly	Trp	Ala	Pro	Arg	Val	Ala	Phe	Asp	Arg	Gly	Leu
	290			295			300								
Ala	Glu	Thr	Val	Asp	Trp	Tyr	Arg	Asp	Asn	Gly	Thr	Trp	Trp	Lys	Ala
305			310			315								320	
Leu	Thr	Pro													

<210> 13
 <211> 305
 <212> PRT
 <213> Streptomyces bikiniensis

<400> 13
 Val Phe Glu Thr Pro Leu Lys Arg Pro Gly Val Arg Gly Ile Ile Leu
 1 5 10 15
 Ala Gly Gly Ser Ala Thr Arg Leu Gln Pro Leu Thr Gly Ala Leu Ser
 20 25 30
 Lys Gln Gln Leu Pro Val Tyr Asp Lys Pro Met Ile Tyr Tyr Pro Leu
 35 40 45
 Ser Val Leu Met Leu Ala Gly Ile Gln Asp Ile Leu Ile Ile Ser Ser
 50 55 60
 His Gln His Val Glu Thr Phe Gln Val Met Leu Gly Asp Gly Ser Arg
 65 70 75 80
 Leu Gly Ile Gln Leu Asp Tyr Ala Val Gln Asp Glu Pro Arg Gly Val
 85 90 95
 Ala Asp Ala Phe Leu Val Gly Asp Lys His Ile Gly Asn Asp Arg Val
 100 105 110
 Ala Leu Ile Leu Gly Asp Asn Val Phe His Gly Pro Gly Phe Ser Thr
 115 120 125
 Val Leu Lys His Ser Leu Arg Arg Leu Asp Gly Cys Glu Leu Phe Gly
 130 135 140
 Tyr Pro Ser Lys Ser Pro Glu Arg Tyr Gly Val Ala Glu Ile Asp Glu
 145 150 155 160
 Gln Gly His Leu Leu Ser Leu Glu Glu Lys Pro Ser Arg Pro Arg Ser
 165 170 175
 Asn Leu Ala Val Thr Gly Leu Tyr Phe Tyr Asp Asn Asp Val Val Glu
 180 185 190
 Leu Ala Lys Asp Leu Lys Pro Ser Ala Arg Gly Glu Leu Glu Ile Thr
 195 200 205
 Asp Ile Asn Leu Ser Tyr Leu Glu Gln Gly Arg Ala Arg Leu Thr Gln
 210 215 220
 Leu Gly Arg Gly Phe Ala Trp Leu Asp Met Gly Thr His Asp Ser Leu
 225 230 235 240
 Leu Gln Ala Gly Gln Tyr Val Gln Leu Leu Glu Gln Arg Gln Gly Val
 245 250 255
 Arg Ile Ala Cys Leu Glu Glu Ile Ala Leu Arg Met Gly Phe Ile Asp
 260 265 270
 Ala Asp Thr Cys Tyr Arg Leu Gly Glu Glu Leu Ser Ala Ser Ser Tyr
 275 280 285
 Gly Asp Tyr Leu Met Glu Val Ala Ser Gly Leu Gly Ala Thr Arg Thr
 290 295 300
 Gly
 305

<210> 14
 <211> 196
 <212> PRT
 <213> Streptomyces bikiniensis

<400> 14
 Met His Pro Leu Ser Ile Glu Gly Ala Trp Ser Gln Glu Pro Val Ile

1			5			10			15						
His	Ser	Asp	His	Arg	Gly	Arg	Ser	His	Glu	Trp	Phe	Arg	Gly	Glu	Ser
			20					25					30		
Phe	Arg	Gln	Ala	Phe	Gly	His	Asp	Phe	Pro	Val	Ala	Gln	Val	Asn	Val
		35					40					45			
Ala	Val	Ser	His	Arg	Gly	Ala	Leu	Arg	Gly	Ile	His	Tyr	Thr	Glu	Ile
	50					55					60				
Pro	Pro	Gly	Gln	Ala	Lys	Tyr	Ser	Val	Cys	Val	Arg	Gly	Ala	Gly	Leu
65					70				75						80
Asp	Val	Val	Val	Asp	Val	Arg	Ile	Gly	Ser	Pro	Thr	Phe	Gly	Arg	Trp
				85					90					95	
Glu	Ile	Val	Pro	Met	Asp	Ala	Glu	Arg	Asn	Thr	Ala	Val	Tyr	Leu	Thr
			100						105				110		
Ala	Gly	Leu	Gly	Arg	Ala	Phe	Leu	Ser	Leu	Thr	Asp	Asp	Ala	Thr	Leu
		115					120					125			
Val	Tyr	Leu	Cys	Ser	Ser	Gly	Tyr	Ala	Pro	Ala	Arg	Glu	His	Ser	Val
	130					135					140				
Asn	Pro	Leu	Asp	Pro	Asp	Leu	Gly	Ile	Ala	Trp	Pro	Asp	Asp	Ile	Glu
145					150					155					160
Pro	Leu	Leu	Ser	Asp	Arg	Asp	Glu	Asn	Ala	Pro	Thr	Leu	Ala	Thr	Ala
			165						170					175	
Glu	Arg	Leu	Gly	Leu	Leu	Pro	Thr	Tyr	Gln	Ala	Trp	Gln	Glu	Gln	Gln
		180						185					190		
Gln	Ala	Gln	Arg												
		195													

<210> 15

<211> 255

<212> PRT

<213> Streptomyces bikiniensis

<400> 15

Met	Thr	Val	Ile	Ala	Ala	Glu	Ala	Asp	Leu	Tyr	Leu	Asp	Leu	Leu	Lys
1				5				10					15		
Lys	Val	Val	Thr	Asn	Met	Ile	Tyr	Glu	Asp	Gln	Thr	Asn	Val	Ala	Gly
			20					25				30			
Leu	Ile	Thr	Ser	Ser	Ser	Tyr	Ser	Ala	Glu	Leu	Arg	Ser	Val	Gly	Glu
	35					40					45				
Asp	Phe	Pro	Arg	Val	Ala	His	Ser	Met	Val	Gly	Leu	Lys	Arg	Leu	Asp
	50				55					60					
Asn	Leu	Gln	Lys	Cys	Leu	Glu	Asp	Val	Leu	Arg	Asp	Gly	Val	Pro	Gly
65				70					75						80
Asp	Phe	Ala	Glu	Thr	Gly	Val	Trp	Arg	Gly	Gly	Ala	Cys	Ile	Phe	Ala
			85						90					95	
Arg	Gly	Val	Phe	Arg	Ala	His	Gly	Val	Arg	Asp	Arg	Lys	Val	Trp	Val
		100						105					110		
Ala	Asp	Ser	Phe	Gln	Gly	Phe	Pro	Lys	Thr	Thr	Glu	Asp	Asp	His	Gln
	115					120						125			
Leu	Asp	Val	Asp	Ile	Asp	Leu	Gly	Gln	Tyr	Asn	Asp	Val	Leu	Ser	Ile
	130				135						140				
Pro	Val	Asp	Val	Glu	Thr	Val	Lys	Gly	Asn	Phe	Ala	Arg	Tyr	Gly	Leu
145				150					155						160
Leu	Asp	Asp	Gln	Val	Arg	Phe	Leu	Pro	Gly	Trp	Phe	Lys	Asp	Thr	Met
		165						170					175		
Pro	Thr	Ala	Pro	Ile	Glu	Arg	Leu	Ala	Val	Leu	Arg	Leu	Asp	Gly	Asp
		180						185					190		

Ser	Tyr	Ala	Ala	Thr	Arg	Glu	Val	Leu	Thr	Asn	Leu	Tyr	His	Lys	Val
		195					200					205			
Ser	Asp	Gly	Gly	Tyr	Val	Ile	Val	Asp	Asp	Tyr	Cys	Ile	Pro	Ala	Cys
	210					215					220				
Arg	Gln	Ala	Val	His	Glu	Phe	Arg	Asp	Glu	His	Gly	Ile	Thr	Asp	Glu
225					230					235					240
Ile	His	Gln	Ile	Asp	Arg	Gln	Gly	Ser	Tyr	Trp	Arg	Arg	Ser	Ser	
				245					250					255	

<210> 16

<211> 420

<212> PRT

<213> Streptomyces bikiniensis

<400> 16

Met	Leu	Asp	Val	Asp	His	Leu	Leu	Pro	Ile	Ala	Phe	Arg	Val	Arg	Lys
1				5					10					15	
Ser	Met	Lys	Ser	Ser	Lys	Val	Val	His	Ser	Arg	Pro	Ala	Glu	Ala	Gly
			20					25					30		
Val	Ala	Trp	Pro	Val	Ala	Arg	Thr	Cys	Pro	Phe	Thr	Leu	Pro	Asp	Gln
		35					40					45			
Tyr	Ala	Glu	Lys	Arg	Lys	Asn	Glu	Pro	Ile	Cys	Arg	Ala	Gln	Val	Trp
	50					55					60				
Asp	Asp	Ser	Arg	Thr	Trp	Leu	Ile	Thr	Lys	His	Glu	His	Val	Arg	Ala
65					70					75					80
Leu	Leu	Ala	Asp	Pro	Arg	Val	Thr	Val	Asp	Pro	Ala	Lys	Leu	Pro	Arg
				85					90					95	
Leu	Ser	Pro	Ser	Asp	Gly	Asp	Gly	Gly	Gly	Phe	Arg	Ser	Leu	Leu	Thr
			100					105					110		
Met	Asp	Pro	Pro	Asp	His	Asn	Ala	Leu	Arg	Arg	Met	Leu	Ile	Ser	Glu
		115					120					125			
Phe	Ser	Val	His	Arg	Val	Arg	Glu	Met	Arg	Pro	Gly	Ile	Glu	Arg	Thr
	130					135					140				
Val	His	Gly	Leu	Leu	Asp	Gly	Ile	Leu	Glu	Arg	Arg	Gly	Pro	Val	Asp
145					150					155					160
Leu	Val	Ala	Glu	Leu	Ala	Leu	Pro	Met	Ser	Thr	Leu	Val	Ile	Cys	Gln
				165					170					175	
Leu	Leu	Gly	Val	Pro	Tyr	Glu	Asp	Arg	Glu	Phe	Phe	Gln	Glu	Arg	Ser
			180					185					190		
Glu	Gln	Ala	Thr	Arg	Val	Gly	Gly	Ser	Gln	Glu	Ser	Leu	Thr	Ala	Leu
		195					200					205			
Leu	Glu	Leu	Arg	Asp	Tyr	Leu	Asp	Arg	Leu	Val	Thr	Ala	Lys	Ile	Glu
	210					215					220				
Thr	Pro	Gly	Asp	Asp	Leu	Cys	Arg	Leu	Ile	Ala	Ser	Arg	Leu	His	
225					230					235					240
Thr	Gly	Glu	Met	Arg	His	Ala	Glu	Ile	Val	Asp	Asn	Ala	Val	Leu	Leu
				245					250					255	
Leu	Ala	Ala	Gly	His	Glu	Thr	Ser	Ala	Ala	Met	Val	Ala	Leu	Gly	Ile
			260					265					270		
Leu	Thr	Leu	Leu	Arg	His	Pro	Gly	Ala	Leu	Ala	Glu	Leu	Arg	Gly	Asp
		275					280					285			
Gly	Thr	Leu	Met	Pro	Gln	Thr	Val	Asp	Glu	Leu	Leu	Arg	Phe	His	Ser
	290					295					300				
Ile	Ala	Asp	Gly	Leu	Arg	Arg	Ala	Val	Thr	Glu	Asp	Ile	Glu	Leu	Gly
305					310					315					320
Gly	Ile	Thr	Leu	Arg	Ala	Gly	Asp	Gly	Leu	Ile	Val	Ser	Leu	Ala	Ser

325 330 335
 Ala Asn Arg Asp Glu Ser Ala Phe Ala Ser Pro Asp Gly Phe Asp Pro
 340 345 350
 His His Pro Ala Ser Arg His Val Ala Phe Gly Tyr Gly Pro His Gln
 355 360 365
 Cys Leu Gly Gln Asn Leu Ala Arg Leu Glu Leu Glu Val Thr Leu Gly
 370 375 380
 Ala Val Val Glu Arg Ile Pro Thr Leu Arg Leu Ala Gly Asp Ala Asp
 385 390 395 400
 Ala Leu Arg Val Lys Gln Asp Ser Thr Ile Phe Gly Leu His Glu Leu
 405 410 415
 Pro Val Glu Trp
 420

<210> 17

<211> 73

<212> PRT

<213> Streptomyces bikiniensis

<400> 17

Val Arg Val Thr Val Asp Gln Ser Arg Cys Leu Gly Ala Gly Gln Cys
 1 5 10 15
 Glu Gln Leu Ala Pro Glu Val Phe Arg Gln Asp Glu Glu Gly Leu Ser
 20 25 30
 Arg Val Leu Val Pro Glu Pro Asp Pro Ala Ser Trp Pro Arg Val Leu
 35 40 45
 Gln Thr Val Asp Leu Cys Pro Val Gln Ala Val Leu Ile Asp Glu Gly
 50 55 60
 Pro Gly Pro Ala Pro Gln Asp Thr Lys
 65 70

<210> 18

<211> 356

<212> PRT

<213> Streptomyces bikiniensis

<400> 18

Met Ala Ala Gly Ala Pro Asp Gly Gly Pro Leu Pro Arg Thr Gly Arg
 1 5 10 15
 Pro His Arg Arg Gly Pro Arg Ser Arg Ala Ala Gly His Gln Val Thr
 20 25 30
 Ala Asp Arg Trp Ala Gly Arg Thr Val Leu Val Thr Gly Ala Leu Gly
 35 40 45
 Phe Ile Gly Ser His Phe Val Arg Gln Leu Glu Ala Arg Gly Ala Glu
 50 55 60
 Val Leu Ala Leu Tyr Arg Thr Glu Arg Pro Gln Leu Gln Ala Glu Leu
 65 70 75 80
 Ala Ala Leu Asp Arg Val Arg Leu Ile Arg Thr Glu Leu Arg Asp Glu
 85 90 95
 Ser Asp Val Arg Gly Ala Phe Lys Tyr Leu Ala Pro Ser Ile Asp Thr
 100 105 110
 Val Val His Cys Ala Ala Met Asp Gly Asn Ala Gln Phe Lys Leu Glu
 115 120 125
 Arg Ser Ala Glu Ile Leu Asp Ser Asn Gln Arg Thr Ile Ser His Leu
 130 135 140

Leu	Asn	Cys	Val	Arg	Asp	Phe	Gly	Val	Gly	Glu	Ala	Val	Val	Met	Ser
145					150					155					160
Ser	Ser	Glu	Leu	Tyr	Cys	Ala	Pro	Pro	Thr	Ala	Ala	Ala	His	Glu	Asp
				165					170					175	
Asp	Asp	Phe	Arg	Arg	Ser	Met	Arg	Tyr	Thr	Asp	Asn	Gly	Tyr	Val	Leu
			180					185					190		
Ser	Lys	Thr	Tyr	Gly	Glu	Ile	Leu	Ala	Arg	Leu	His	Arg	Glu	Gln	Phe
		195					200				205				
Gly	Thr	Asn	Val	Phe	Leu	Val	Arg	Pro	Gly	Asn	Val	Tyr	Gly	Pro	Gly
	210					215					220				
Asp	Gly	Tyr	Asp	Pro	Ser	Arg	Gly	Arg	Val	Ile	Pro	Ser	Met	Leu	Ala
225					230					235					240
Lys	Ala	Asp	Ala	Gly	Glu	Glu	Ile	Glu	Ile	Trp	Gly	Asp	Gly	Ser	Gln
				245					250					255	
Thr	Arg	Ser	Phe	Ile	His	Val	Thr	Asp	Leu	Val	Arg	Ala	Ser	Leu	Arg
			260					265					270		
Leu	Leu	Glu	Thr	Gly	Lys	Tyr	Pro	Glu	Met	Asn	Val	Ala	Gly	Ala	Glu
		275					280					285			
Gln	Val	Ser	Ile	Leu	Glu	Leu	Ala	Arg	Met	Val	Met	Ala	Val	Leu	Gly
	290					295					300				
Arg	Pro	Glu	Arg	Ile	Arg	Leu	Asp	Pro	Gly	Arg	Pro	Val	Gly	Ala	Pro
305					310					315					320
Ser	Arg	Leu	Leu	Asp	Leu	Thr	Arg	Met	Ser	Glu	Val	Ile	Asp	Phe	Glu
				325					330					335	
Pro	Gln	Pro	Leu	Arg	Thr	Gly	Leu	Glu	Thr	Ala	Arg	Trp	Phe	Arg	
			340					345					350		
His	His	Thr	Arg												
			355												

<210> 19

<211> 326

<212> PRT

<213> Streptomyces Bikiniensis

<400> 19

Val	Thr	Ala	Asp	Arg	Trp	Ala	Gly	Arg	Thr	Val	Leu	Val	Thr	Gly	Ala
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Leu	Gly	Phe	Ile	Gly	Ser	His	Phe	Val	Arg	Gln	Leu	Glu	Ala	Arg	Gly
			20					25					30		
Ala	Glu	Val	Leu	Ala	Leu	Tyr	Arg	Thr	Glu	Arg	Pro	Gln	Leu	Gln	Ala
		35					40					45			
Glu	Leu	Ala	Ala	Leu	Asp	Arg	Val	Arg	Leu	Ile	Arg	Thr	Glu	Leu	Arg
	50					55					60				
Asp	Glu	Ser	Asp	Val	Arg	Gly	Ala	Phe	Lys	Tyr	Leu	Ala	Pro	Ser	Ile
65					70					75					80
Asp	Thr	Val	Val	His	Cys	Ala	Ala	Met	Asp	Gly	Asn	Ala	Gln	Phe	Lys
				85					90					95	
Leu	Glu	Arg	Ser	Ala	Glu	Ile	Leu	Asp	Ser	Asn	Gln	Arg	Thr	Ile	Ser
			100					105					110		
His	Leu	Leu	Asn	Cys	Val	Arg	Asp	Phe	Gly	Val	Gly	Glu	Ala	Val	Val
		115					120					125			
Met	Ser	Ser	Ser	Glu	Leu	Tyr	Cys	Ala	Pro	Pro	Thr	Ala	Ala	Ala	His
		130					135				140				
Glu	Asp	Asp	Asp	Phe	Arg	Arg	Ser	Met	Arg	Tyr	Thr	Asp	Asn	Gly	Tyr
145					150					155					160
Val	Leu	Ser	Lys	Thr	Tyr	Gly	Glu	Ile	Leu	Ala	Arg	Leu	His	Arg	Glu

Trp Lys His Phe Phe His Arg Gly Glu Ile Tyr Gly Leu Asp Ile Val
 225 230 235 240
 Asp Lys Ser His Phe Asp Ala Pro Arg Ile Thr Thr Leu Arg Gly Asp
 245 250 255
 Gln Ser Asp Pro Asp His Leu Arg Ser Ile Ala Glu Lys Tyr Gly Pro
 260 265 270
 Phe Asp Ile Val Ile Asp Asp Gly Ser His Ile Asn Asp His Ile Arg
 275 280 285
 Thr Ser Phe Gln Ala Leu Phe Pro His Val Arg Pro Gly Gly Leu Tyr
 290 295 300
 Val Ile Glu Asp Leu Trp Thr Ala Tyr Trp Ser Gly Phe Gly Gly Asp
 305 310 315 320
 Glu Asp Pro Lys Arg Tyr Ser Gly Thr Ser Leu Gly Leu Leu Lys Ser
 325 330 335
 Leu Val Asp Ser Ile Gln His Glu Glu Leu Pro Glu Ala Gly Asp His
 340 345 350
 Arg Pro Ser Tyr Ala Asp Gln His Val Val Gly Met His Leu Tyr His
 355 360 365
 Asn Leu Ala Phe Ile Glu Lys Gly Thr Asn Ala Glu Gly Gly Ile Pro
 370 375 380
 Pro Trp Ile Pro Arg Asp Phe Glu Thr Leu Val Ala Val Ser Ser Gly
 385 390 395 400
 Gly His Ala

<210> 21

<211> 418

<212> PRT

<213> Streptomyces bikiniensis

<400> 21

Met Arg Val Thr Leu Leu Ser Val Gly Ser Arg Gly Asp Val Gln Pro
 1 5 10 15
 Phe Val Ala Leu Gly Ile Gly Leu Lys Ala Arg Gly His Asp Val Thr
 20 25 30
 Leu Ala Ala Pro Ala Thr Leu Arg Pro Leu Val Glu Arg Ala Gly Leu
 35 40 45
 Thr Tyr Arg Leu Ser Pro Gly Asp Pro Asp Gly Phe Phe Thr Met Pro
 50 55 60
 Glu Val Val Glu Ala Leu Arg Arg Gly Pro Ser Phe Lys Asn Met Leu
 65 70 75 80
 Ala Gly Met Pro Glu Ala Pro Glu Ser Tyr Thr Gln Gln Val Val Asp
 85 90 95
 Ala Ile His Asp Ala Ala Glu Gly Ala Asp Leu Ile Val Asn Ala Pro
 100 105 110
 Leu Thr Leu Ala Ala Ala Tyr Gly His Pro Pro Ala Pro Trp Ala Ser
 115 120 125
 Val Ser Trp Trp Pro Asn Ser Met Thr Ser Ala Phe Pro Ala Val Glu
 130 135 140
 Ser Gly Gln Arg His Leu Gly Pro Leu Thr Ser Leu Tyr Asn Arg Tyr
 145 150 155 160
 Thr His Arg Arg Ala Ala Arg Asp Glu Trp Glu Trp Arg Arg Pro Glu
 165 170 175
 Ile Asp Gly Tyr Arg Arg Arg Leu Gly Leu Arg Pro Phe Gly Asp Glu
 180 185 190
 Ser Pro Phe Leu Arg Leu Gly His Asp Arg Pro Tyr Leu Phe Pro Phe

Phe	Ala	Pro	Arg	Asn	Gly	Pro	Glu	Leu	His	Arg	Val	Leu	His	Pro	Arg
				165					170					175	
Gly	Val	Leu	Leu	Val	Val	Thr	Pro	Leu	Pro	Asp	His	Leu	Arg	Glu	Val
			180					185					190		
Ile	Gly	Ala	Leu	Gly	Leu	Leu	Gln	Val	Asp	Glu	Gly	Lys	Glu	Ser	Arg
		195					200					205			
Leu	Ala	Glu	Gln	Leu	Ala	Pro	His	Phe	Ser	Ala	Val	Ala	Thr	Glu	Glu
	210					215					220				
Leu	Thr	Arg	Thr	Met	Ala	Leu	Asp	His	Gln	Ala	Leu	Ala	His	Leu	Val
225					230					235					240
Gly	Met	Gly	Pro	Asn	Ala	Trp	His	Arg	Asp	Ala	Gln	Arg	Asp	Leu	Glu
				245					250					255	
Thr	Ile	Gln	Arg	Leu	Pro	Ala	Pro	Thr	Arg	Val	Thr	Leu	Ser	Val	Arg
			260					265					270		
Leu	Ser	Ala	Tyr	Arg	Leu	Ser	Ala								
		275					280								

<210> 23

<211> 4441

<212> PRT

<213> Streptomyces bikiniensis

<400> 23

Met	Arg	Ala	Pro	Tyr	Gly	Asn	Arg	Gln	Val	Asn	Arg	Arg	Phe	Leu	Arg
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Glu	Phe	Arg	Ala	Lys	Arg	Pro	His	Cys	Val	Ser	Pro	Leu	His	Phe	Leu
			20					25					30		
Ala	Glu	Phe	Ser	Glu	Ser	Arg	Gln	Thr	Thr	Gly	Ser	Ala	Gly	Val	Thr
		35					40					45			
Ala	Pro	Ile	Asp	Arg	Pro	Gly	Val	Ser	Met	Ala	Pro	Lys	Ser	Gly	Ala
	50					55					60				
Gln	Arg	Ser	Ser	Asp	Ile	Ala	Val	Val	Gly	Met	Ser	Cys	Arg	Leu	Pro
65					70				75					80	
Gly	Ala	Pro	Gly	Ile	Asp	Glu	Phe	Trp	His	Leu	Leu	Thr	Thr	Gly	Gly
				85					90					95	
Ser	Ala	Ile	Glu	Arg	Arg	Ala	Asp	Gly	Thr	Trp	Arg	Gly	Ser	Leu	Asp
			100					105					110		
Gly	Ala	Ala	Asp	Phe	Asp	Ala	Ala	Phe	Phe	Asp	Met	Thr	Pro	Arg	Gln
		115					120					125			
Ala	Ala	Ala	Ala	Asp	Pro	Gln	Gln	Arg	Leu	Met	Leu	Glu	Leu	Gly	Trp
		130				135					140				
Thr	Ala	Leu	Glu	Asn	Ala	Gly	Ile	Val	Pro	Gly	Ser	Leu	Ala	Gly	Thr
145				150						155					160
Asp	Thr	Gly	Val	Phe	Val	Gly	Ile	Ala	Ala	Asp	Asp	Tyr	Ala	Ala	Leu
				165					170					175	
Leu	His	Arg	Ser	Ala	Thr	Pro	Val	Ser	Gly	His	Thr	Ala	Thr	Gly	Leu
			180					185					190		
Ser	Arg	Gly	Met	Ala	Ala	Asn	Arg	Leu	Ser	Tyr	Leu	Leu	Gly	Leu	Arg
		195					200					205			
Gly	Pro	Ser	Leu	Ala	Val	Asp	Ser	Ala	Gln	Ser	Ser	Ser	Leu	Val	Ala
	210					215					220				
Val	His	Leu	Ala	Cys	Glu	Ser	Leu	Arg	Arg	Gly	Glu	Ser	Asp	Leu	Ala
225					230					235					240
Ile	Val	Gly	Gly	Val	Ser	Leu	Ile	Leu	Ala	Glu	Asp	Ser	Thr	Ala	Gly
				245					250					255	
Met	Glu	Leu	Met	Gly	Ala	Leu	Ser	Pro	Asp	Gly	Arg	Cys	His	Thr	Phe

Ala Gly Gly Gly Gly Gly Leu Ser Val Ala Val Val Asn Ala Pro Ser
 725 730 735
 Ser Thr Val Val Ala Gly Glu Leu Gly Asp Leu Asp Arg Phe Val Ala
 740 745 750
 Ala Cys Glu Ala Glu Gly Val Arg Ala Arg Arg Leu Glu Phe Gly Tyr
 755 760 765
 Ala Ser His Ser Arg Phe Val Glu Pro Val Arg Glu Arg Leu Leu Glu
 770 775 780
 Gly Leu Ala Asp Val Arg Pro Val Arg Gly Arg Ile Pro Phe Tyr Ser
 785 790 795 800
 Thr Val Glu Ala Ala Glu Phe Asp Thr Ala Gly Leu Asp Ala Glu Tyr
 805 810 815
 Trp Phe Gly Asn Leu Arg Arg Pro Val Arg Phe Gln Glu Thr Val Glu
 820 825 830
 Arg Leu Leu Ala Asp Gly Phe Arg Val Phe Val Glu Cys Gly Ala His
 835 840 845
 Pro Val Leu Thr Gly Ala Val Gln Glu Thr Ala Glu Thr Ala Gly Arg
 850 855 860
 Glu Ile Cys Ser Val Gly Ser Leu Arg Arg Asp Glu Gly Gly Leu Arg
 865 870 875 880
 Arg Phe Leu Thr Ser Ala Ala Glu Ala Phe Val Gln Gly Val Glu Val
 885 890 895
 Ser Trp Pro Val Leu Phe Asp Gly Thr Gly Ala Arg Thr Val Asp Leu
 900 905 910
 Pro Thr Tyr Pro Phe Gln Arg Arg His His Trp Ala Pro Asp Gly Ser
 915 920 925
 Ala Ser Ala Ala Pro Thr Arg Asp Ile Arg Pro Asp Glu Thr Ala Ala
 930 935 940
 Val Pro Ala Asp Thr Met Asp Leu Ala Gly Gln Leu Arg Ala Asp Val
 945 950 955 960
 Ala Ser Leu Pro Thr Thr Glu Gln Ile Ala Arg Leu Leu Asp Gln Val
 965 970 975
 Arg Asp Gly Val Ala Thr Val Leu Gly Leu Asp Ala Arg Asp Glu Val
 980 985 990
 Arg Ala Glu Ala Thr Phe Lys Glu Leu Gly Val Glu Ser Leu Thr Gly
 995 1000 1005
 Val Glu Leu Lys Asn His Leu Arg Ala Arg Thr Gly Leu His Val Pro
 1010 1015 1020
 Thr Ser Leu Ile Tyr Asp Cys Pro Thr Pro Leu Ala Ala Ala His Tyr
 1025 1030 1035 1040
 Leu Arg Asp Glu Leu Leu Gly Arg Pro Ala Glu Gln Ala Val Val Pro
 1045 1050 1055
 Ala Gly Ile Pro Val Asp Glu Pro Ile Ala Ile Val Gly Met Gly Cys
 1060 1065 1070
 Arg Leu Pro Gly Gly Val Ser Ser Pro Glu Gly Leu Trp Asp Leu Val
 1075 1080 1085
 Ala Ser Gly Val Asp Ala Val Ser Pro Phe Pro Thr Asp Arg Gly Trp
 1090 1095 1100
 Asp Val Gly Gly Leu Phe Asp Pro Glu Pro Gly Val Pro Gly Arg Ser
 1105 1110 1115 1120
 Tyr Val Arg Glu Gly Gly Phe Leu His Glu Ala Gly Glu Phe Asp Ala
 1125 1130 1135
 Gly Phe Phe Gly Ile Ser Pro Arg Glu Ala Leu Ala Met Asp Pro Gln
 1140 1145 1150
 Gln Arg Leu Leu Leu Glu Thr Ser Trp Glu Ala Leu Glu Arg Ala Gly
 1155 1160 1165
 Ile Asp Pro His Thr Leu Arg Gly Ser Arg Thr Gly Val Tyr Ala Gly

1170	1175	1180
Val Met Ala Gln Glu Tyr Gly Pro Arg Leu His Glu Gly Ala Asp Gly		
1185	1190	1195
Tyr Glu Gly Tyr Leu Leu Thr Gly Ser Ser Ser Val Ala Ser Gly		1200
	1205	1210
Arg Ile Ser Tyr Val Leu Gly Leu Glu Gly Pro Ala Val Thr Val Asp		1215
	1220	1225
Thr Ala Cys Ser Ser Ser Leu Val Ala Leu His Leu Ala Val Arg Ala		1230
	1235	1240
Leu Arg Ser Gly Glu Cys Asp Leu Ala Leu Ala Gly Gly Ala Thr Val		1245
	1250	1255
Met Ala Glu Pro Gly Met Phe Val Glu Phe Ser Arg Gln Arg Gly Leu		1260
1265	1270	1275
Ser Ala His Gly Arg Cys Lys Ala Tyr Ser Asp Ser Ala Asp Gly Thr		1280
	1285	1290
Gly Trp Ala Glu Gly Ala Gly Val Leu Leu Val Glu Arg Leu Ser Asp		1295
	1300	1305
Ala Val Arg His Gly Arg Arg Val Leu Ala Val Val Arg Gly Ser Ala		1310
	1315	1320
Val Asn Gln Asp Gly Ala Ser Asn Gly Leu Thr Ala Pro Asn Gly Arg		1325
	1330	1335
Ser Gln Ser Arg Leu Ile Arg Gln Ala Leu Ala Asp Ala Arg Leu Gly		1340
1345	1350	1355
Val Ala Asp Val Asp Val Val Glu Gly His Gly Thr Gly Thr Arg Leu		1360
	1365	1370
Gly Asp Pro Ile Glu Ala Gln Ala Leu Leu Ala Thr Tyr Gly Gln Arg		1375
	1380	1385
Asp Ala Gly Arg Pro Leu Arg Leu Gly Ser Leu Lys Ser Asn Val Gly		1390
	1395	1400
His Thr Gln Ala Ala Ala Gly Val Ala Gly Val Ile Lys Met Val Met		1405
	1410	1415
Ala Met Arg His Gly Val Leu Pro Lys Thr Leu His Val Asp Glu Pro		1420
1425	1430	1435
Thr Ala Glu Val Asp Trp Ser Ala Gly Ala Val Ser Leu Leu Arg Glu		1440
	1445	1450
Gln Glu Ala Trp Pro Arg Gly Glu Arg Val Arg Arg Ala Gly Val Ser		1455
	1460	1465
Ser Phe Gly Val Ser Gly Thr Asn Ala His Val Val Val Glu Glu Ala		1470
	1475	1480
Pro Val Pro Glu Asp Gly Glu Ala Ile Glu Gly Gly Ala Pro Leu Ala		1485
	1490	1495
Val Val Pro Val Val Val Ser Gly Arg Ser Ala Gly Ala Val Ala Glu		1500
1505	1510	1515
Leu Ala Gly Arg Val Ser Glu Val Ala Gly Ser Gly Arg Leu Val Asp		1520
	1525	1530
Val Gly Leu Ser Ser Val Val Ser Arg Ser Val Phe Glu His Arg Ser		1535
	1540	1545
Val Val Leu Ala Gly Asp Ser Ala Glu Leu Asn Ala Gly Leu Asp Ala		1550
	1555	1560
Leu Ala Ala Asp Gly Val Ser Pro Val Leu Val Ser Gly Val Ala Ser		1565
	1570	1575
Gly Glu Gly Gly Arg Ser Val Phe Val Phe Pro Gly Gln Gly Thr Gln		1580
1585	1590	1595
Trp Ala Gly Met Ala Leu Gly Leu Trp Ala Glu Ser Ala Val Phe Ala		1600
	1605	1610
Glu Ser Met Ala Arg Cys Glu Ala Ala Phe Ala Gly Leu Val Glu Trp		1615
	1620	1625
		1630

Arg Leu Ala Asp Val Leu Gly Asp Gly Ser Ala Leu Glu Arg Val Asp
 1635 1640 1645
 Val Val Gln Pro Ala Ser Phe Ala Val Met Val Ser Leu Ala Glu Leu
 1650 1655 1660
 Trp Arg Ser Leu Gly Val Val Pro Asp Ala Val Val Gly His Ser Gln
 1665 1670 1675 1680
 Gly Glu Ile Ala Ala Val Val Ala Gly Gly Leu Ser Leu Glu Asp
 1685 1690 1695
 Gly Ala Arg Val Val Val Leu Arg Ala Arg Leu Ile Gly Arg Glu Leu
 1700 1705 1710
 Ala Gly Arg Gly Gly Met Ala Ser Val Ala Leu Pro Val Ala Val Val
 1715 1720 1725
 Glu Glu Arg Leu Ala Gly Trp Ala Gly Arg Leu Gly Val Ala Val Val
 1730 1735 1740
 Asn Gly Pro Ser Ala Thr Val Val Ala Gly Asp Val Asp Ala Val Gly
 1745 1750 1755 1760
 Glu Phe Val Thr Ala Cys Glu Val Glu Gly Val Arg Ala Arg Val Leu
 1765 1770 1775
 Pro Val Asp Tyr Ala Ser His Ser Ala His Val Glu Asp Leu Lys Ala
 1780 1785 1790
 Glu Leu Glu Gln Ile Leu Ala Gly Ile Gly Pro Val Thr Gly Gly Ile
 1795 1800 1805
 Pro Phe Tyr Ser Thr Ser Glu Ala Ala Gln Ile Asp Thr Ala Gly Leu
 1810 1815 1820
 Asp Ala Gly Tyr Trp Phe Gly Asn Leu Arg Arg Pro Val Arg Phe Gln
 1825 1830 1835 1840
 Glu Thr Val Glu Arg Leu Leu Ala Asp Gly Phe Arg Val Phe Val Glu
 1845 1850 1855
 Cys Gly Ala His Pro Val Leu Thr Gly Ala Val Gln Glu Thr Ala Glu
 1860 1865 1870
 Ser Thr Gly Arg Gln Val Cys Ala Val Gly Ser Leu Arg Arg Asp Glu
 1875 1880 1885
 Gly Gly Leu Arg Arg Phe Leu Thr Ser Ala Ala Glu Ala Phe Val Gln
 1890 1895 1900
 Gly Val Gly Val Ser Trp Pro Ala Leu Phe Asp Gly Thr Gly Ala Arg
 1905 1910 1915 1920
 Thr Val Asp Leu Pro Thr Tyr Pro Phe Gln Arg Arg Arg Tyr Trp Leu
 1925 1930 1935
 Glu Ser Arg Pro Pro Ala Ala Val Val Pro Ser Gly Val Gln Asp Gly
 1940 1945 1950
 Leu Ser Tyr Glu Val Val Trp Lys Ser Leu Pro Val Arg Glu Ser Ser
 1955 1960 1965
 Arg Leu Asp Gly Arg Trp Leu Leu Val Val Pro Glu Thr Leu Asp Ala
 1970 1975 1980
 Asp Gly Thr Arg Ile Ala His Asp Leu Gln His Ala Leu Thr Thr His
 1985 1990 1995 2000
 Gly Ala Thr Val Ser Arg Val Ser Val Asp Val Thr Thr Ile Asp Arg
 2005 2010 2015
 Ala Asp Leu Ser Ala Arg Leu Thr Thr Ser Ala Ala Glu Asp Gln Glu
 2020 2025 2030
 Pro Leu Gly Arg Val Val Ser Leu Leu Gly Trp Ala Glu Gly Val Arg
 2035 2040 2045
 Ala His Gly Pro Asn Val Pro Thr Ser Val Ala Ala Ser Leu Ala Leu
 2050 2055 2060
 Val Gln Ala Val Gly Asp Ala Gly Phe Gly Val Pro Val Trp Ala Val
 2065 2070 2075 2080
 Thr Arg Gly Ala Val Ser Val Val Pro Gly Glu Val Pro Glu Thr Ala

2085										2090										2095										
Gly	Ala	Gln	Leu	Trp	Ala	Leu	Gly	Arg	Val	Ala	Gly	Leu	Glu	Leu	Pro															
2100										2105										2110										
Asp	Arg	Trp	Gly	Gly	Leu	Ile	Asp	Leu	Pro	Ala	Asp	Ala	Asp	Ala	Arg															
2115										2120										2125										
Thr	Ala	Gly	Leu	Ala	Val	Arg	Ala	Leu	Ala	Ala	Gly	Ile	Ala	Asp	Gly															
2130										2135										2140										
Glu	Asp	Gln	Val	Ala	Val	Arg	Pro	Ser	Gly	Ala	Tyr	Gly	Arg	Arg	Val															
2145										2150										2155										
Val	Gln	Ala	Ala	His	Arg	Glu	Pro	Ser	Gly	Ala	Lys	Thr	Glu	Trp	Arg															
2165										2170										2175										
Pro	Arg	Gly	Thr	Val	Leu	Val	Thr	Gly	Gly	Met	Gly	Ala	Ile	Gly	Thr															
2180										2185										2190										
Arg	Val	Ala	Arg	Trp	Leu	Ala	Arg	Asn	Gly	Ala	Glu	His	Leu	Val	Leu															
2195										2200										2205										
Thr	Gly	Arg	Arg	Gly	Ala	Gly	Thr	Pro	Gly	Ala	Asp	Glu	Leu	Ala	Gly															
2210										2215										2220										
Glu	Leu	Arg	Ala	Ser	Gly	Val	Gln	Val	Thr	Leu	Ala	Ala	Cys	Asp	Val															
2225										2230										2235										
Ser	Asp	Arg	Ala	Ala	Leu	Ala	Ala	Leu	Leu	Asp	Ala	His	Pro	Pro	Thr															
2245										2250										2255										
Ala	Val	Phe	His	Thr	Ala	Gly	Val	Leu	Asn	Asp	Gly	Thr	Val	Asp	Thr															
2260										2265										2270										
Leu	Thr	Pro	Ala	His	Leu	Asp	Gly	Val	Leu	Ser	Pro	Lys	Ala	Thr	Ala															
2275										2280										2285										
Ala	Val	His	Leu	His	Glu	Leu	Thr	Ala	His	Leu	Asp	Leu	Asp	Ala	Phe															
2290										2295										2300										
Val	Leu	Phe	Ala	Ser	Val	Thr	Gly	Val	Trp	Gly	Asn	Gly	Gly	Gln	Ala															
2305										2310										2315										
Gly	Tyr	Ala	Met	Ala	Asn	Ala	Ala	Leu	Asp	Ala	Leu	Ala	Glu	Gln	Arg															
2325										2330										2335										
Arg	Ala	Gly	Gly	Leu	Ala	Ala	Thr	Ser	Ile	Ser	Trp	Gly	Leu	Trp	Gly															
2340										2345										2350										
Gly	Gly	Gly	Met	Ala	Glu	Gly	Asp	Gly	Glu	Val	Ser	Leu	Asn	Arg	Arg															
2355										2360										2365										
Gly	Ile	Arg	Ala	Leu	Glu	Pro	Ala	Thr	Gly	Ile	Glu	Ala	Leu	Gln	Arg															
2370										2375										2380										
Thr	Leu	Asp	Gln	Gly	Ala	Thr	Cys	Arg	Thr	Val	Val	Asp	Val	Asp	Trp															
2385										2390										2395										
Gly	Gln	Phe	Ala	Pro	Arg	Thr	Ala	Ala	Leu	Arg	Arg	Gly	Arg	Leu	Phe															
2405										2410										2415										
Ala	Asp	Leu	Pro	Glu	Val	Arg	Arg	Val	Leu	Glu	Ser	Glu	Gly	Val	Ala															
2420										2425										2430										
Arg	Glu	Asp	Ala	Gly	Thr	Val	Glu	Pro	Gly	Ala	Val	Leu	Ala	Glu	Arg															
2435										2440										2445										
Leu	Ala	Ser	Arg	Ser	Glu	Ala	Glu	Gln	Arg	Arg	Met	Leu	Val	Glu	Leu															
2450										2455										2460										
Val	Arg	Ala	Glu	Ala	Ala	Ala	Val	Leu	Arg	His	Asp	Thr	Thr	Asp	Leu															
2465										2470										2475										
Leu	Ala	Pro	Arg	Arg	Ser	Phe	Lys	Asp	Ala	Gly	Phe	Asp	Ser	Leu	Thr															
2485										2490										2495										
Ala	Leu	Glu	Leu	Arg	Asn	Arg	Leu	Asn	Thr	Ala	Thr	Gly	Val	Val	Leu															
2500										2505										2510										
Pro	Val	Thr	Val	Val	Phe	Asp	His	Pro	Asn	Pro	Gly	Ala	Leu	Ala	Asp															
2515										2520										2525										
Phe	Leu	Tyr	Gly	Glu	Ala	Leu	Gly	Leu	Ser	Ala	Ala	Arg	Ser	Ser	Ala															

2530		2535		2540
Ser Asp Thr Ala Asp Thr Thr Arg Pro Ala Ala Ala Pro Glu Glu Pro				
2545		2550		2555
Ile Ala Ile Val Gly Met Ala Cys Arg Tyr Pro Gly Glu Ala Arg Ser				2560
	2565		2570	2575
Pro Glu Glu Leu Trp Lys Leu Leu Ile Asp Glu Arg Asp Val Ile Gly				
	2580		2585	2590
Pro Met Pro Thr Asp Arg Gly Trp Asp Val Gly Gly Leu Phe Asp Pro				
	2595		2600	2605
Glu Pro Gly Val Pro Gly Arg Ser Tyr Val Arg Glu Gly Gly Phe Leu				
	2610		2615	2620
His Glu Ala Gly Glu Phe Asp Ala Gly Phe Phe Gly Ile Ser Pro Arg				
2625		2630		2635
Glu Ala Leu Ala Met Asp Pro Gln Gln Arg Leu Leu Leu Glu Thr Ser				2640
	2645		2650	2655
Trp Glu Ala Leu Glu Arg Ala Gly Ile Asp Pro His Thr Leu Arg Gly				
	2660		2665	2670
Ser Gln Thr Gly Val Tyr Ala Gly Met Phe His Gln Glu Tyr Ala Thr				
	2675		2680	2685
Arg Leu His Glu Ala Pro Val Glu Phe Glu Gly His Leu Leu Thr Gly				
	2690		2695	2700
Thr Ser Gly Ser Val Ala Ser Gly Arg Ile Ser Tyr Val Leu Gly Leu				
2705		2710		2715
Glu Gly Pro Ala Val Thr Val Asp Thr Ala Cys Ser Ser Ser Leu Val				2720
	2725		2730	2735
Ala Leu His Leu Ala Val Arg Ala Leu Arg Ser Gly Glu Cys Asp Leu				
	2740		2745	2750
Ala Leu Ala Gly Gly Val Thr Val Met Ala Glu Pro Gly Val Phe Val				
	2755		2760	2765
Glu Phe Ser Arg Gln Arg Gly Leu Ala Ala Asp Gly Arg Cys Lys Ala				
	2770		2775	2780
Phe Ala Ala Ala Ala Asp Gly Thr Gly Trp Ala Glu Gly Val Gly Val				
2785		2790		2795
Leu Ala Val Glu Arg Leu Ser Asp Ala Val Arg His Gly Arg Arg Val				2800
	2805		2810	2815
Leu Ala Val Val Arg Gly Ser Ala Val Asn Gln Asp Gly Ala Ser Asn				
	2820		2825	2830
Gly Leu Thr Ala Pro Asn Gly Pro Ser Gln Gln Arg Val Ile Arg Gln				
	2835		2840	2845
Ala Leu Ala Asp Ala Arg Leu Gly Val Ala Asp Val Asp Val Val Glu				
	2850		2855	2860
Gly His Gly Thr Gly Thr Arg Leu Gly Asp Pro Ile Glu Ala Gln Ala				
2865		2870		2875
Leu Leu Ala Thr Tyr Gly Gln Arg Asp Ala Gly Arg Pro Leu Arg Leu				2880
	2885		2890	2895
Gly Ser Leu Lys Ser Asn Val Gly His Thr Gln Ala Ala Ala Gly Val				
	2900		2905	2910
Ala Gly Val Ile Lys Met Val Met Ala Met Arg His Gly Val Leu Pro				
	2915		2920	2925
Lys Thr Leu His Val Asp Glu Val Ser Pro His Val Asp Trp Ser Ala				
	2930		2935	2940
Gly Ala Val Ser Leu Leu Thr Glu Gln Glu Pro Trp Pro Arg Gly Glu				
2945		2950		2955
Arg Val Arg Arg Ala Gly Val Ser Ala Phe Gly Val Ser Gly Thr Asn				
	2965		2970	2975
Ala His Val Val Val Glu Glu Ala Pro Ala Ser Glu Ala Pro Val Ala				
	2980		2985	2990

Val Glu Pro Val Glu Pro Gly Ala Val Gly Leu Leu Pro Val Val Pro
2995 3000 3005
Val Val Val Ser Gly Arg Ser Ala Gly Ala Val Ala Glu Leu Ala Ser
3010 3015 3020
Arg Leu Asn Glu Ser Val Arg Ser Asp Arg Leu Val Asp Val Gly Leu
3025 3030 3035 3040
Ser Ser Val Val Ser Arg Ser Val Phe Glu His Arg Ser Val Val Leu
3045 3050 3055
Ala Gly Asp Ser Ala Glu Leu Ser Ala Gly Leu Asp Ala Leu Ala Ala
3060 3065 3070
Asp Gly Val Ser Pro Val Leu Val Ser Gly Val Ala Ser Val Gly Gly
3075 3080 3085
Gly Arg Ser Val Phe Val Phe Pro Gly Ala Gly Val Lys Trp Ala Gly
3090 3095 3100
Met Ala Leu Gly Leu Trp Ala Glu Ser Ala Val Phe Ala Glu Ser Met
3105 3110 3115 3120
Ala Arg Cys Glu Ala Ala Phe Ala Gly Leu Val Glu Trp Arg Leu Ala
3125 3130 3135
Asp Val Leu Gly Asp Gly Ala Ala Leu Glu Arg Glu Asp Val Val Gln
3140 3145 3150
Pro Ala Ser Phe Ala Val Met Val Ser Leu Ala Ala Leu Trp Arg Ser
3155 3160 3165
Leu Gly Val Val Pro Asp Ala Val Val Gly His Ser Gln Gly Glu Ile
3170 3175 3180
Ala Ala Ala Val Val Ala Gly Gly Leu Ser Leu Glu Asp Gly Ala Arg
3185 3190 3195 3200
Val Val Val Leu Arg Ala Arg Val Ala Glu Glu Val Leu Ser Gly Gly
3205 3210 3215
Gly Ile Ala Ser Val Arg Leu Ser Arg Ala Glu Val Glu Glu Arg Leu
3220 3225 3230
Ala Gly Gly Gly Gly Gly Leu Ser Val Ala Val Val Asn Ala Pro Ser
3235 3240 3245
Ser Thr Val Val Ala Gly Glu Leu Gly Glu Leu Asp Arg Phe Val Ala
3250 3255 3260
Ala Cys Glu Ala Glu Gly Val Arg Ala Arg Arg Leu Glu Phe Gly Tyr
3265 3270 3275 3280
Ala Ser His Ser Arg Phe Val Glu Pro Val Arg Glu Arg Leu Leu Glu
3285 3290 3295
Gly Leu Ala Asp Val Arg Pro Val Arg Gly Arg Ile Pro Phe Tyr Ser
3300 3305 3310
Thr Val Glu Ala Gly Glu Phe Asp Thr Ala Gly Leu Asp Ala Glu Tyr
3315 3320 3325
Trp Phe Gly Asn Leu Arg Arg Pro Val Arg Phe Gln Glu Thr Val Glu
3330 3335 3340
Arg Leu Leu Ala Asp Gly Phe Arg Val Phe Val Glu Cys Gly Ala His
3345 3350 3355 3360
Pro Val Leu Thr Gly Ala Val Gln Glu Thr Ala Glu Thr Ala Gly Arg
3365 3370 3375
Glu Val Cys Ala Val Gly Ser Leu Arg Arg Asp Glu Gly Gly Leu Arg
3380 3385 3390
Arg Phe Leu Thr Ser Ala Ala Glu Ala Phe Val Gln Gly Val Glu Val
3395 3400 3405
Ser Trp Pro Val Leu Phe Asp Gly Thr Gly Ala Arg Thr Val Asp Leu
3410 3415 3420
Pro Thr Tyr Pro Phe Gln Arg Arg His Tyr Trp Ala Gln Ser Ser Pro
3425 3430 3435 3440
Ala Gly Ala Gly Ser Ser Ala Ala Ala Arg Phe Gly Met Thr Trp Glu

Ala Gln Thr Glu His Pro Asp Arg Phe Val Leu Val Asp His Asp Gly
 3905 3910 3915 3920
 Gln Asp Ala Ser Tyr Arg Thr Leu Pro Thr Ala Leu Asp Ser Glu Ile
 3925 3930 3935
 Pro Gln Leu Ala Leu Arg Ala Gly Glu Thr Leu Ala Pro Glu Leu Ala
 3940 3945 3950
 Val Leu Pro Ser Pro Ala Asp Gly Gly Pro Ala Thr Ser Ala Ala Phe
 3955 3960 3965
 Asp Pro Glu Gly Thr Val Leu Val Thr Gly Ala Thr Gly Thr Leu Gly
 3970 3975 3980
 Ser Leu Leu Ala Arg His Leu Val Thr Ala His Gly Val Arg His Leu
 3985 3990 3995 4000
 Leu Leu Leu Ser Arg Ser Gly Arg Glu Ala Ala Gly Ala Ala Glu Leu
 4005 4010 4015
 Glu Arg Glu Leu Arg Gln Arg Gly Ala Glu Phe Gln Leu Leu Ser Cys
 4020 4025 4030
 Asp Ala Thr Asp Arg Ala Ala Leu Lys Glu Ala Leu Ala Thr Val Pro
 4035 4040 4045
 Ala Ala His Pro Leu Thr Ala Val Ile His Thr Ala Gly Val Leu Asp
 4050 4055 4060
 Asp Gly Val Val Glu Ala Leu Thr Pro Glu Arg Leu Asp Arg Val Leu
 4065 4070 4075 4080
 Arg Pro Lys Ala Asp Ala Ala Leu Asn Leu His Asp Leu Thr Glu Gly
 4085 4090 4095
 Met Pro Leu Lys Ala Phe Val Leu Tyr Ser Gly Ala Val Gly Leu Leu
 4100 4105 4110
 Gly Gly Ala Gly Gln Ala Asn Tyr Ala Ala Ala Asn Ala Phe Leu Asp
 4115 4120 4125
 Gly Leu Ala Gln His Arg His Ala Gln Gly Leu Pro Ala Val Ser Leu
 4130 4135 4140
 Ala Trp Gly Leu Trp Ser Ala Thr Ser Thr Phe Thr Asp His Leu Gly
 4145 4150 4155 4160
 Glu Val Asp Leu Arg Arg Met Glu Arg Ser Gly Ile Thr Pro Leu Thr
 4165 4170 4175
 Asp Glu Gln Gly Leu Asp Leu Phe Asp Arg Ala Leu Gly Ala Ala Val
 4180 4185 4190
 Asp Ala Pro Gln Leu Cys Val Met Gly Leu Asp Thr Ala Ala Leu Arg
 4195 4200 4205
 Arg Gln Ala Ala Glu His Gly Pro Thr Ser Met Pro Pro Leu Leu Arg
 4210 4215 4220
 Thr Leu Ala Ala Pro Pro Val Arg Arg Gly Ala Gly Arg Ser Gly Arg
 4225 4230 4235 4240
 Gly Gly Arg Ala Ala Ser Ala Thr Asp Ala Pro Ser Arg Ala Gln Ala
 4245 4250 4255
 Leu Arg Glu Arg Leu Thr Gly Leu Asp Ala Ala Ala Arg Arg Asp Glu
 4260 4265 4270
 Leu Leu Val Leu Ser Gln Ala Gln Leu Ala Asp Val Leu Gly Phe Ala
 4275 4280 4285
 Asp Lys Thr Ala Val Asp Pro Val Arg Ser Phe Arg Glu Ile Gly Leu
 4290 4295 4300
 Asp Ser Leu Thr Ala Val Glu Leu Arg Asn Arg Leu Gly Val Val Thr
 4305 4310 4315 4320
 Gly Leu Arg Leu Pro Pro Ala Leu Val Phe Asp His Pro Asn Leu Asp
 4325 4330 4335
 Ala Leu Ala Ala His Leu Ala Glu Leu Leu Ala Ala Glu Gly Arg Asp
 4340 4345 4350
 Asp Ala Gly Ala Ala Ala Leu Ser Gly Ile Asp Ala Leu Asp Arg Ala

4355	4360	4365
Val Arg Glu Met Ala Ala Asp Asp Thr Arg Arg Asp Ala Val Arg Arg		
4370	4375	4380
Arg Leu Ala Glu Leu Leu Ala Val Val Gly Asp Ala Pro Arg Asp Gly		
4385	4390	4395
Gly Arg Ala Pro Arg Ala Ala Ala Asp Ala Gly Gly Arg Asp Ala Gln		4400
	4405	4410
Ala Asp Pro Asp Leu Leu Gly Arg Leu Asp Ser Ala Ser Asp Asp Asp		4415
	4420	4425
Leu Phe Ala Phe Ile Glu Asp Gln Leu		4430
4435	4440	

<210> 24

<211> 1974

<212> PRT

<213> Streptomyces bikiniensis

<400> 24

Met Thr Ala Asn Asp Asp Lys Ile Arg Asp Tyr Leu Lys Arg Val Val		
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Ala Glu Leu His Ser Thr Arg Gln Arg Leu Asn Ala Leu Glu His Asp		15
	20	25
Ala Arg Glu Pro Ile Ala Ile Val Gly Met Ser Cys Arg Leu Pro Gly		30
	35	40
Gly Val Thr Thr Pro Glu Ser Leu Trp Arg Leu Val Asp Ser Gly Thr		45
	50	55
Asp Ala Ala Ser Pro Phe Pro Asp Asp Arg Gly Trp Asp Leu Asp Ala		60
65	70	75
Leu His His Pro Glu Ser Gly Ala Val His Ser Arg Glu Gly Gly Phe		80
	85	90
Leu His Asp Ser Ala Asp Phe Asp Ala Glu Phe Phe Gly Ile Ser Pro		95
	100	105
Arg Glu Ala Leu Ala Met Asp Pro Gln Gln Arg Leu Leu Leu Glu Thr		110
	115	120
Ala Trp Glu Val Phe Glu Arg Ala Gly Ile Asp Pro Val Ser Ala Arg		125
	130	135
Gly Ser Arg Thr Gly Val Tyr Ala Gly Val Met Tyr His Asp Tyr Gly		140
145	150	155
Ala Arg Leu Asn Glu Ile Pro Pro Gly Leu Glu Gly Tyr Leu Val Asn		160
	165	170
Gly Ser Ala Gly Ser Ile Ala Ser Gly Arg Val Ala Tyr Thr Leu Gly		175
	180	185
Leu Glu Gly Pro Ala Val Thr Val Asp Thr Ala Cys Ser Ser Ser Leu		190
	195	200
Val Ala Val His Leu Ala Ala Gln Ala Leu Arg Arg Arg Glu Cys Asp		205
	210	215
Met Ala Leu Ala Gly Gly Ala Thr Val Leu Ser Thr Pro Asp Leu Phe		220
225	230	235
Ile Asp Phe Ala Arg Leu Gly Gly Leu Ala Ser Asp Gly Arg Cys Lys		240
	245	250
Ala Phe Ser Asp Ala Ala Asp Gly Thr Ser Phe Ala Glu Gly Ala Gly		255
	260	265
Leu Leu Leu Leu Met Arg Leu Ser Asp Ala Val Ala Glu Gly His Thr		270
	275	280
Val Leu Ala Val Val Arg Gly Ser Ala Val Asn Gln Asp Gly Ala Ser		285
	290	295
		300

Asn	Gly	Leu	Thr	Ala	Pro	Asn	Gly	Leu	Ala	Gln	Gln	Arg	Val	Ile	Arg	
305					310					315					320	
Glu	Ala	Leu	Ala	Asp	Ala	Asp	Leu	Asp	Pro	Asp	Gln	Ile	Asp	Ala	Val	
				325					330					335		
Glu	Ala	His	Gly	Thr	Gly	Thr	Arg	Leu	Gly	Asp	Pro	Ile	Glu	Ala	Gln	
			340					345					350			
Ala	Leu	Leu	His	Thr	Tyr	Gly	Thr	Ser	Arg	Ser	Pro	Glu	Arg	Pro	Leu	
		355					360					365				
Trp	Leu	Gly	Ser	Leu	Lys	Ser	Asn	Ile	Gly	His	Thr	Gln	Ala	Ala	Ala	
	370					375					380					
Gly	Val	Ala	Gly	Val	Ile	Lys	Thr	Val	Leu	Ala	Met	Arg	His	Gly	Arg	
385					390					395					400	
Leu	Pro	Arg	Thr	Leu	His	Val	Thr	Arg	Pro	Ser	Ser	Arg	Val	Glu	Trp	
				405					410					415		
Ser	Ala	Gly	Ala	Val	Glu	Leu	Leu	Thr	Arg	Ala	Gln	Asp	Trp	Pro	Gly	
			420					425					430			
Gln	Gly	Asn	Ala	Pro	Arg	Arg	Ala	Gly	Val	Ser	Ser	Phe	Gly	Ala	Ser	
		435					440					445				
Gly	Thr	Asn	Ala	His	Leu	Ile	Leu	Glu	Gly	Val	Pro	Asp	Gly	Asp	Ile	
	450					455					460					
Thr	Val	Ala	Glu	Thr	Arg	Pro	Ala	Thr	Gly	Gly	Gly	Ala	Trp	Pro	Leu	
465					470					475					480	
Ala	Gly	Arg	Thr	Glu	Ala	Ala	Leu	Arg	Ala	Gln	Ala	Arg	Arg	Leu	His	
				485					490					495		
Asp	His	Leu	Ala	Ala	Arg	Pro	His	Val	Ser	Pro	Ala	Ala	Val	Gly	Arg	
			500					505					510			
Thr	Leu	Val	Arg	Ser	Arg	Thr	Ala	Phe	Glu	His	Arg	Ala	Val	Val	Leu	
		515					520					525				
Gly	Gln	Asp	Thr	Ala	Asp	Leu	Leu	Ser	Gly	Leu	Ala	Glu	Leu	Ala	Ser	
	530					535					540					
Gly	Gly	Ala	His	Gly	Pro	Gly	Val	Ile	Thr	Gly	Arg	Ala	Ala	Arg	Gly	
545					550					555					560	
Arg	Arg	Thr	Ala	Leu	Leu	Phe	Thr	Gly	Gln	Gly	Ser	Gln	Arg	Pro	Gly	
				565					570					575		
Ala	Gly	Arg	His	Leu	Tyr	Glu	Arg	Tyr	Glu	Val	Phe	Ala	Arg	Ala	Leu	
			580					585					590			
Asp	Glu	Thr	Ala	Ala	Ala	Leu	Asp	Arg	His	Leu	Asp	Arg	Pro	Leu	Arg	
	595						600					605				
Asp	Val	Met	Phe	Ala	Glu	Pro	Gly	Gly	Ala	Thr	Ala	Gly	Leu	Leu	Asp	
	610					615					620					
Arg	Thr	Glu	Tyr	Thr	Gln	Pro	Ala	Leu	Phe	Ala	Leu	Glu	Val	Ala	Leu	
625					630					635					640	
Phe	Arg	Leu	Val	Thr	Ala	Gly	Gly	Leu	Arg	Pro	Asp	Ala	Leu	Leu	Gly	
				645					650					655		
His	Ser	Val	Gly	Glu	Leu	Ala	Ala	Ala	His	Val	Ala	Gly	Val	Phe	Thr	
			660					665					670			
Leu	Pro	Asp	Ala	Ala	Arg	Leu	Val	Thr	Ala	Arg	Gly	Arg	Leu	Met	Gly	
		675					680					685				
Glu	Leu	Pro	Ala	Gly	Gly	Ala	Met	Met	Ala	Ile	Gln	Ala	Ser	Gly	Pro	
	690					695					700					
Glu	Ile	Glu	Glu	Thr	Ile	Thr	Ala	Leu	Ala	Ala	His	Arg	Ser	Ala	Arg	
705					710					715					720	
Val	Ala	Val	Ala	Ala	Leu	Asn	Gly	Pro	Asp	Ala	Thr	Val	Ile	Ser	Gly	
				725					730					735		
Asp	Glu	Asp	Val	Val	Ala	Glu	Leu	Ala	Thr	Leu	Trp	Arg	Glu	Arg	Gly	
			740					745					750			
Arg	Arg	Thr	Arg	Ala	Leu	Pro	Val	Ser	His	Ala	Phe	His	Ser	Pro	His	

1650	1655	1660
Trp Gly Asp Gly Gly Asp Gly Arg Asp Gly Gly Gly Ser Ala Ala Asp		
1665	1670	1675
Gly Met Gly Ala Ser Leu Ala Ala Ala Asp Leu Ala Arg Leu Arg Arg		1680
	1685	1690
Ser Gly Ile Leu Pro Leu Asp Pro Ala Glu Ala Leu Arg Leu Phe Asp		1695
	1700	1705
Glu Ala Cys Asp Pro Ala Arg Thr Glu Ala Val Leu Leu Pro Ile Arg		1710
	1715	1720
Leu Asp Leu Thr Gly Leu Arg Ala Arg Ser Ala Arg Gly Ala Val His		1725
	1730	1735
Ala Ser Val Val Pro Glu Val Leu His Thr Leu Val Pro Pro Pro Ala		1740
1745	1750	1755
Gly Ala Gly Ser Pro Ala Gly Ala Asp Ala Ser Asp Pro Ala Ala Gly		1760
	1765	1770
Gln Ala Pro Pro Ala Pro Ala Ser Asp Thr Leu Ala Glu Arg Leu Ala		1775
	1780	1785
Gly Lys Pro Arg Gly Glu Arg Leu Thr Ala Leu Thr Glu Leu Val Arg		1790
	1795	1800
Thr Glu Ile Ala Ser Val Leu Gly His Pro Asp Ser Gly Arg Val Gln		1805
	1810	1815
Leu Gln Ser Ser Phe Lys Glu Ser Gly Phe Asp Ser Leu Thr Ala Val		1820
1825	1830	1835
Glu Leu Arg Asn Arg Leu Thr Ala Ala Thr Gly Thr Lys Leu Pro Ala		1840
	1845	1850
Thr Leu Val Phe Asp His Pro Thr Pro Ala Ala Leu Val Asp His Leu		1855
	1860	1865
Glu Gln Glu Leu Pro Lys Ala Ala Gln Glu Ile Pro Ala Asp Leu Pro		1870
	1875	1880
Ala Val Leu Asp Ala Leu Asp Arg Ile Arg Asp Gly Leu Ala Thr Ala		1885
	1890	1895
Ala Thr Asp Asp Ser Ser Arg Asp His Ile Ala Glu Arg Leu Gln Ala		1900
1905	1910	1915
Leu Leu Gly Thr Leu Thr Ser Ala Ala Gly Val Ser Arg Pro Thr Gly		1920
	1925	1930
Ser Pro Gly Glu His Asp Arg Gln Gly Pro Asp Glu Leu Ser Leu Gly		1935
	1940	1945
Gln Arg Leu Ala Ala Ser Ser Asp Asp Glu Leu Phe Asp Leu Phe Asp		1950
	1955	1960
Ser Asp Phe Arg Ser Thr		1965
1970		

<210> 25

<211> 3788

<212> PRT

<213> Streptomyces bikiniensis

<400> 25

Met Ser Ser Thr Ser Pro Ala Thr Asn Glu Glu Lys Leu Arg Asp Tyr	
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	15
	20
Arg Thr Glu Ser Ala Arg His Glu Pro Ile Ala Ile Val Gly Met Gly	25
	30
	35
Cys Arg Leu Pro Gly Gly Val Ser Ser Pro Glu Gly Leu Trp Asp Leu	40
	45
	50
	55
	60

Val	Ala	Ser	Gly	Val	Asp	Ala	Val	Ser	Pro	Phe	Pro	Thr	Asp	Arg	Gly	65	70	75	80
Trp	Asp	Val	Gly	Gly	Leu	Phe	Asp	Pro	Glu	Pro	Gly	Val	Pro	Gly	Arg				
			85						90					95					
Ser	Tyr	Val	Arg	Glu	Gly	Gly	Phe	Leu	His	Glu	Ala	Gly	Glu	Phe	Asp				
			100					105					110						
Ala	Gly	Phe	Gly	Gly	Ile	Ser	Pro	Arg	Glu	Ala	Leu	Ala	Met	Asp	Pro				
			115					120					125						
Gln	Gln	Arg	Leu	Leu	Leu	Glu	Thr	Ser	Trp	Glu	Ala	Leu	Glu	Arg	Ala				
			130					135					140						
Gly	Ile	Asp	Pro	His	Thr	Leu	Arg	Gly	Ser	Arg	Thr	Gly	Val	Tyr	Ala				
							150								160				
Gly	Val	Met	Tyr	His	Asp	Tyr	Gly	Ser	Thr	Ala	Thr	Val	Ser	Val	Ala				
							165								175				
Ser	Asp	Asp	Glu	Thr	Ala	Gly	Phe	Leu	Gly	Thr	Gly	Thr	Ser	Gly	Ser				
			180					185						190					
Val	Ala	Ser	Gly	Arg	Ile	Ser	Tyr	Val	Leu	Gly	Leu	Glu	Gly	Pro	Ala				
			195					200					205						
Val	Thr	Val	Asp	Thr	Ala	Cys	Ser	Ser	Ser	Leu	Val	Ala	Leu	His	Leu				
			210					215					220						
Ala	Val	Arg	Ala	Leu	Arg	Ser	Gly	Glu	Cys	Asp	Leu	Ala	Leu	Ala	Gly				
							230								240				
Gly	Val	Thr	Val	Met	Ala	Glu	Pro	Gly	Val	Phe	Val	Glu	Phe	Ser	Arg				
							245								255				
Gln	Arg	Gly	Leu	Ala	Ala	Asp	Gly	Arg	Cys	Lys	Ala	Phe	Ala	Ala	Ala				
								265						270					
Ala	Asp	Gly	Thr	Gly	Trp	Ala	Glu	Gly	Val	Gly	Val	Leu	Ala	Val	Glu				
								280					285						
Arg	Leu	Ser	Asp	Ala	Val	Arg	His	Gly	Arg	Arg	Val	Leu	Ala	Val	Val				
								295					300						
Arg	Gly	Ser	Ala	Val	Asn	Gln	Asp	Gly	Ala	Ser	Asn	Gly	Leu	Thr	Ala				
							310								320				
Pro	Asn	Gly	Pro	Ser	Gln	Gln	Arg	Val	Ile	Arg	Gln	Ala	Leu	Ala	Asp				
							325								335				
Ala	Arg	Leu	Gly	Val	Ala	Asp	Val	Asp	Val	Val	Glu	Gly	His	Gly	Thr				
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Gly	Thr	Arg	Leu	Gly	Asp	Pro	Ile	Glu	Ala	Gln	Ala	Leu	Leu	Ala	Thr				
								360					365						
Tyr	Gly	Gln	Arg	Asp	Ala	Gly	Arg	Ala	Leu	Arg	Leu	Gly	Ser	Leu	Lys				
								375					380						
Ser	Asn	Val	Gly	His	Thr	Gln	Ala	Ala	Ala	Gly	Val	Ala	Gly	Val	Ile				
							390								400				
Lys	Met	Val	Met	Ala	Met	Arg	His	Gly	Val	Leu	Pro	Lys	Thr	Leu	His				
							405								415				
Val	Asp	Glu	Pro	Thr	Ala	Glu	Val	Asp	Trp	Ser	Ala	Gly	Ala	Val	Ser				
								425					430						
Leu	Leu	Arg	Glu	Gln	Glu	Ala	Trp	Pro	Glu	Val	Gly	Arg	Leu	Arg	Arg				
								440					445						
Ala	Ala	Val	Ser	Ser	Phe	Gly	Val	Ser	Gly	Thr	Asn	Ala	His	Val	Val				
								455					460						
Val	Glu	Glu	Ala	Pro	Ala	Ser	Glu	Ala	Pro	Val	Ala	Gly	Glu	Pro	Val				
							470								480				
Glu	Pro	Val	Glu	Pro	Gly	Ala	Val	Gly	Leu	Leu	Pro	Val	Val	Pro	Val				
							485								495				
Val	Val	Ser	Gly	Arg	Ser	Ala	Gly	Ala	Val	Ala	Glu	Leu	Ala	Ser	Arg				
								505					510						
Leu	Asn	Glu	Ser	Val	Arg	Ser	Asp	Arg	Leu	Val	Asp	Val	Gly	Leu	Ser				

Ile Ala His Asp Leu Gln His Ala Leu Thr Thr His Gly Ala Thr Val
980 985 990
His Thr Leu Ala Leu Asp Pro Ser Ala Ala His Phe Asp Gly Leu Phe
995 1000 1005
Asp Gly Ile Leu Gln Glu Glu Thr Asp Val Thr Gly Ile Phe Ser Leu
1010 1015 1020
Leu Gly Leu Ala Ser Gly Pro His Pro Asp His Gly Glu Val Glu Leu
1025 1030 1035 1040
Ala Gly Ala Ala Ser Leu Thr Leu Met Arg Gln Ala Gln Arg Asp Gly
1045 1050 1055
Phe Arg Ala Pro Val Trp Ala Val Thr Arg Gly Ala Val Ser Val Val
1060 1065 1070
Pro Gly Glu Val Pro Glu Thr Ala Gly Ala Gln Leu Trp Ala Leu Gly
1075 1080 1085
Arg Val Ala Gly Leu Glu Leu Pro Asp Arg Trp Gly Gly Leu Ile Asp
1090 1095 1100
Leu Pro Ala Asp Ala Asp Ala Arg Thr Ala Gly Leu Ala Val Arg Ala
1105 1110 1115 1120
Leu Ala Ala Gly Ile Ala Asp Gly Glu Asp Gln Leu Ala Val Arg Pro
1125 1130 1135
Ser Gly Ala Tyr Gly Arg Arg Leu Val Arg Ala Thr Ala Arg Gly
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Arg Lys Asp Trp Arg Pro Gln Gly Thr Val Leu Leu Ala Gly His Leu
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Asp Ala Val Gly Glu Pro Leu Ala Arg Trp Leu Leu Thr Gly Gly Ala
1170 1175 1180
Asp His Val Val Leu Ala Asp Pro Ala Leu Thr Glu Leu Pro Ala Thr
1185 1190 1195 1200
Leu Ala Asp Leu Ala Gln Thr Val Thr Thr Ala Ala Ala Pro Asp Leu
1205 1210 1215
Ala Asp Arg Ala Val Leu Ala Ala Leu Val Thr Glu Tyr Val Pro Ala
1220 1225 1230
Thr Val Val Val Val Pro Pro Ala Ala Glu Leu Ala Pro Leu Ala Ser
1235 1240 1245
Ile Ser Pro Ala Asp Leu Ala Ala Ala Val Thr Ala Lys Ser Ala Thr
1250 1255 1260
Ala Ala His Phe Asp Ala Leu Leu Asp Gly Pro His Ala Pro Glu Leu
1265 1270 1275 1280
Val Leu Ile Ser Ser Val Ala Gly Ile Trp Gly Gly Val Arg Gln Gly
1285 1290 1295
Ala Tyr Ala Val Gly Ala Ala His Leu Asp Ala Leu Ala Ala Arg Arg
1300 1305 1310
Arg Ala Arg Gly Leu Ser Ala Ala Ser Val Ala Trp Thr Pro Trp Ala
1315 1320 1325
Gly Ser Val Thr Ala Asp Gly Ser Ala Ala Glu Ser Leu Arg Gln Tyr
1330 1335 1340
Gly Ile Ala Pro Leu Glu Pro Gln Ala Ala Leu Ala Glu Leu Asp Arg
1345 1350 1355 1360
Ala Leu Asn Gln Gln Leu His Gly Gly Gly Gly Asp Ala Ala Val Ala
1365 1370 1375
Asp Ile Asp Trp Glu Arg Phe Leu Ala Ser Phe Thr Ser Val Arg Pro
1380 1385 1390
Ser Val Leu Phe Asp Glu Leu Pro Glu Val Arg Arg Leu Arg Glu Ala
1395 1400 1405
Glu Ala Ala Ala Met Ala Asp Gln Ala Ala Ala Arg Thr Gly Ala Pro
1410 1415 1420
Gly Gly Thr Glu Leu Ala Arg Ser Leu Arg Ala Lys Ser Leu Asn Ala

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Gln Arg Thr Ala	Leu Glu Leu Val Thr	Ala His Val Ala	Ala Val			
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Leu Gly Glu Ser	Val Pro Glu Ala Ile	Asp Arg Ser Arg	Ala Phe Lys			
	1460		1465		1470	
Asp Ile Gly Phe	Thr Ser Met Thr	Ala Met Glu Leu	Arg Asn Arg Leu			
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Lys Glu Ala Thr	Gly Leu Ala Leu	Pro Ala Ser Leu	Val Phe Asp His			
	1490		1495		1500	
Pro His Pro Gly	Ala Leu Ala Asp	His Leu Arg Glu	Glu Glu Leu Leu Gly			
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Glu Asp Gly Ala	Ala Gly Ala Asp	Ser Ala Ala Glu	Glu Glu Pro Ser Ala			
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Thr Ser Pro Thr	Val Gln Asp Glu	Pro Ile Ala Ile	Ile Ile Gly Met Ala			
	1540		1545		1550	
Cys Arg Leu Pro	Gly Asp Val Gly	Thr Pro Asp Glu	Leu Trp Glu Leu			
	1555		1560		1565	
Leu Glu Thr Gly	Arg Asp Ala Met	Ser Asp Leu Pro	Val Asn Arg Gly			
	1570		1575		1580	
Trp Asp Val Ala	Gly Leu Tyr Asp	Pro Asp Pro Asp	Ala Ala Gly Arg			
1585		1590		1595		1600
Ser Tyr Val Arg	Glu Gly Gly Phe	Leu His Asp Ala	Gly Glu Phe Asp			
	1605		1610		1615	
Ala Glu Phe Phe	Gly Ile Ser Pro	Arg Glu Ala Leu	Ala Met Asp Pro			
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Gln Gln Arg Ile	Val Leu Glu Leu	Ala Trp Glu Ser	Phe Glu Arg Ala			
	1635		1640		1645	
Gly Leu Asp Pro	Ala Gly Arg Arg	Gly Ser Arg Thr	Gly Val Phe Met			
	1650		1655		1660	
Gly Thr Asn Gly	Gln His Tyr Met	Pro Leu Leu Gln	Asn Gly Asn Asp			
1665		1670		1675		1680
Ser Phe Asp Gly	Tyr Leu Gly Thr	Gly Asn Ser Ala	Ser Val Met Ser			
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Gly Arg Ile Ser	Tyr Thr Leu Gly	Leu Glu Gly Pro	Ala Leu Thr Val			
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Asp Thr Ala Cys	Ser Ser Ser Leu	Val Ala Leu His	Leu Ala Val Arg			
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Ala Leu Arg Asn	Gly Glu Cys Asp	Leu Ala Leu Ala	Gly Gly Ala Thr			
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Val Met Ser Thr	Pro Glu Val Leu	Val Glu Phe Ser	Arg Gln Arg Ala			
1745		1750		1755		1760
Val Ser Ala Asp	Gly Arg Cys Lys	Ala Phe Ser Ala	Ser Ala Asp Gly			
	1765		1770		1775	
Phe Gly Pro Ala	Glu Gly Ala Gly	Val Leu Leu Val	Glu Arg Leu Ser			
	1780		1785		1790	
Asp Ala Val Arg	His Gly Arg Arg	Val Leu Ala Val	Val Arg Gly Ser			
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Ala Val Asn Gln	Asp Gly Ala Ser	Asn Gly Leu Thr	Ala Pro Asn Gly			
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Pro Ser Gln Gln	Arg Val Ile Arg	Gln Ala Leu Ala	Asp Ala Arg Leu			
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Gly Val Ala Asp	Val Asp Val Val	Glu Gly His Gly	Thr Gly Thr Arg			
	1845		1850		1855	
Leu Gly Asp Pro	Ile Glu Ala Gln	Ala Leu Leu Ala	Thr Tyr Gly Gln			
	1860		1865		1870	
Arg Asp Ala Gly	Arg Pro Leu Arg	Leu Gly Ser Leu	Lys Ser Asn Val			
	1875		1880		1885	

Gly	His	Thr	Gln	Ala	Ala	Ala	Gly	Val	Ala	Gly	Val	Ile	Lys	Met	Val
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Met	Ala	Met	Arg	His	Gly	Val	Leu	Pro	Lys	Thr	Leu	His	Val	Asp	Glu
1905					1910					1915					1920
Val	Ser	Pro	His	Val	Asp	Trp	Ser	Ala	Gly	Ala	Val	Ser	Leu	Leu	Thr
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Glu	Gln	Glu	Pro	Trp	Pro	Glu	Val	Gly	Arg	Pro	Arg	Arg	Ala	Ala	Val
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Ser	Ser	Phe	Gly	Leu	Ser	Gly	Thr	Asn	Ala	His	Val	Val	Val	Glu	Glu
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Ala	Pro	Val	Gly	Glu	Ala	Gly	Gln	Ala	Ala	Gly	Asp	Ala	Arg	Leu	Ala
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1985					1990					1995					2000
Leu	Ala	Ser	Arg	Leu	Asn	Glu	Ser	Ile	Arg	Ser	Asp	Arg	Leu	Val	Asp
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Val	Gly	Leu	Ser	Ser	Val	Val	Ser	Arg	Ser	Val	Phe	Glu	His	Arg	Ser
			2020					2025					2030		
Val	Leu	Leu	Ala	Gly	Asp	Ser	Gly	Glu	Leu	His	Thr	Gly	Leu	Val	Ala
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Val	Gly	Gly	Gly	Arg	Ser	Val	Phe	Val	Phe	Pro	Gly	Gln	Gly	Thr	Gln
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Trp	Ala	Gly	Met	Ala	Leu	Gly	Leu	Trp	Ala	Glu	Ser	Ser	Val	Phe	Ala
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	2130					2135					2140				
Trp	Arg	Ser	Leu	Gly	Val	Val	Pro	Asp	Ala	Val	Val	Gly	His	Ser	Gln
2145				2150					2155						2160
Gly	Glu	Ile	Ala	Ala	Ala	Val	Val	Ala	Gly	Gly	Leu	Ser	Leu	Glu	Asp
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Gly	Ala	Arg	Val	Val	Val	Leu	Arg	Ala	Arg	Leu	Ile	Gly	Arg	Glu	Leu
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Ala	Gly	Arg	Gly	Gly	Met	Ala	Ser	Val	Ala	Leu	Pro	Val	Ala	Val	Val
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Asn	Gly	Pro	Ser	Ala	Thr	Val	Val	Ala	Gly	Asp	Val	Asp	Ala	Val	Ala
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Glu	Phe	Val	Thr	Ala	Cys	Glu	Val	Glu	Gly	Val	Arg	Ala	Arg	Val	Leu
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Pro	Val	Asp	Tyr	Ala	Ser	His	Ser	Ala	His	Val	Glu	Asp	Leu	Lys	Ala
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Glu	Leu	Glu	Glu	Val	Leu	Ala	Gly	Ile	Gly	Pro	Val	Thr	Gly	Gly	Ile
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Pro	Phe	Tyr	Ser	Thr	Ser	Glu	Ala	Ala	Gln	Ile	Asp	Thr	Ala	Gly	Leu
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Asp	Ala	Gly	Tyr	Trp	Phe	Gly	Asn	Leu	Arg	Arg	Pro	Val	Arg	Phe	Gln
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Glu	Thr	Val	Glu	Arg	Leu	Leu	Ala	Asp	Gly	Phe	Arg	Val	Phe	Val	Glu
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Cys	Gly	Ala	His	Pro	Val	Leu	Thr	Gly	Ala	Val	Gln	Glu	Thr	Ala	Glu

Gly Pro Arg Leu Asp Gly Pro Gly Leu Ala Glu Ala Leu Ser Glu Ala
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 Gly Met Gly Thr Glu Arg His Arg Asn Leu Ala Asp Ala Leu Ser Ala
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 Val Arg Thr Pro Val Asp Thr Ala Gly Ser Ala Ala Ala Gly Thr
 2835 2840 2845
 Thr Ser Leu Ile Ala Val Pro Val Pro Gln Ser Pro Thr Met Asp Ala
 2850 2855 2860
 Gly Ala Val Arg His Ala Val His Arg Ala Leu Glu Leu Val Gln Gly
 2865 2870 2875 2880
 Trp Val Ala Ala Asp Glu Ala Ala Glu Glu Gly Gly Ser Asp Gly Ala
 2885 2890 2895
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 Gly Asp Ala Asp Pro Leu Arg Asp Pro Val Ala Ala Ala Val Trp Gly
 2915 2920 2925
 Leu Ile Lys Ser Ala Gln Ser Glu Gln Pro Gly Arg Ile Val Leu Val
 2930 2935 2940
 Asp Leu Asp Glu Gly Ala Val Asp Gly Ala Ala Leu Ala Ala Ala Ile
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 Ser Thr Gly Glu Pro Gln Leu Ala Leu Arg Asp Gly Asp Val His Val
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 Pro Ala Gly Thr Arg Ala Trp His Leu Val Gly Ala Gly Thr Gly Thr
 2995 3000 3005
 Leu Ser Asp Leu Ala Leu Val Pro Ala Gln Thr Asp Thr Val Ala Leu
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 Ala Pro Gly Gln Val Arg Ile Ala Val Arg Ala Ala Gly Leu Asn Phe
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 Arg Asp Thr Leu Ile Ala Leu Gly Met Tyr Pro Gly Glu Gly Val Met
 3045 3050 3055
 Gly Ala Glu Gly Ala Gly Val Ile Thr Glu Val Gly Pro Asp Val Val
 3060 3065 3070
 Ser Leu Ala Val Gly Asp Arg Val Leu Gly Met Trp Thr Asp Gly Phe
 3075 3080 3085
 Gly Pro Tyr Val Val Ala Asp His Arg Met Val Ala Pro Met Pro Arg
 3090 3095 3100
 Asp Trp Ser Tyr Ala Glu Ala Ala Ser Val Pro Ala Val Phe Leu Ser
 3105 3110 3115 3120
 Ala Tyr Tyr Gly Leu Arg His Leu Ala Gly Leu Arg Ala Gly Gln Ser
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 Leu Ala Arg His Phe Gly Ala Glu Val Phe Gly Thr Ala Gly Thr Ala
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 Lys Trp Asp Ala Leu Arg Ala Gln Gly Leu Asp Asp Arg His Ile Ala
 3170 3175 3180
 Gly Ser Arg Thr Leu Asp Phe Ala Asp Arg Phe Leu Asp Ala Thr Glu
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 Gly Arg Gly Val Asp Val Val Leu Asn Ser Leu Ala Gly Asp Phe Val
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 Asp Ala Ser Leu Arg Leu Leu Pro Arg Gly Gly Arg Phe Val Glu Leu
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 Gly Thr Val Tyr Arg Ala Phe Glu Leu Met Glu Ala Gly Pro Glu Leu

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Ile Gly Arg Met Leu Asn Glu Leu Leu Glu Leu Phe Glu Ser Gly Ala		
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Leu Arg Leu Leu Pro Val Thr Pro Tyr Asp Ile Arg Arg Ala Pro Asp		3280
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Ala Phe Arg Thr Leu Ser Gln Ala Gly His Val Gly Lys Leu Val Leu		3295
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Thr Met Pro Pro Ala Phe Glu Pro His Gly Thr Val Leu Ile Thr Gly		3310
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Gly Thr Gly Asn Leu Gly Gly Thr Leu Ala Arg His Leu Val Thr Glu		3325
	3330	3335
His Gly Val Arg His Leu Leu Leu Ala Gly Arg Arg Gly Pro Glu Ala		3340
3345	3350	3355
Glu Gly Ala Ala Glu Leu Val Arg Glu Leu His Asp Leu Gly Ala Ser		3360
	3365	3370
Val Thr Val Ala Ala Cys Asp Val Ala Asp Arg Ala Ala Leu Arg Lys		3375
	3380	3385
Leu Leu Gly Gly Ile Pro Pro Glu Arg Pro Leu Thr Gly Val Val His		3390
	3395	3400
Ala Ala Gly Val Leu Asp Asp Gly Val Val Thr Ser Leu Thr Pro Asp		3405
	3410	3415
Arg Val Asp Gly Val Leu Arg Pro Lys Val Asp Ala Ala Leu Asn Leu		3420
3425	3430	3435
His Glu Ala Ala Leu Asp Pro Glu Leu Gly Leu Asp Ile Thr Ala Phe		3440
	3445	3450
Val Leu Phe Ser Ser Val Ala Ala Leu Leu Gly Gly Ser Gly Gln Gly		3455
	3460	3465
Ser Tyr Ala Ala Ala Asn Gly Phe Leu Asp Gly Leu Ala Gln Tyr Arg		3470
	3475	3480
Arg Gly Arg Ser Leu Pro Ala Leu Ser Leu Gly Trp Gly Leu Ala Gly		3485
	3490	3495
Ser Gly Arg Met Thr Ser His Leu Asp Ser Arg Ala Leu Leu Arg Arg		3500
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Met Ala Arg Gly Gly Val Leu Pro Leu Ser Pro Ala Glu Ser Met Ala		3520
	3525	3530
Leu Phe Asp Ala Ala Gln Gly Phe Asp Glu Ala Leu Gln Val Pro Ala		3535
	3540	3545
Arg Phe His Thr Ala Ala Leu Gly Ala Asp Gly Asn Val Pro Pro Leu		3550
	3555	3560
Phe Asn Gly Leu Ile Arg Gly Gly Thr Ala His Ala Glu Ala Arg Arg		3565
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Arg Thr Val Gly Ala Ser Pro Ala Gly Gly Pro Ala Gly Gly Glu Pro		3585
3585	3590	3595
Val Asn Leu Ala Asp Arg Leu Ser Gly Leu Thr Glu Asp Glu Gln Arg		3600
	3605	3610
Ala Leu Leu Leu Asp Thr Val Arg Thr His Ala Ala Leu Val Leu Gly		3615
	3620	3625
His Thr Gly Thr Asp Gly Ile Gln Ala Asp Arg Ala Phe Lys Asp Leu		3630
	3635	3640
Gly Phe Asp Ser Leu Thr Ala Val Glu Met Arg Asn Arg Leu Thr Ala		3645
	3650	3655
Ala Thr Gly Leu His Leu Ala Ala Thr Leu Val Phe Asp His Pro Ala		3660
3665	3670	3675
Pro Ala Asp Leu Ala Glu His Leu Arg Ser Arg Leu Val Pro Glu Gly		3680
	3685	3690
Thr Asp Val Pro Pro Leu Leu Ala Glu Leu Gly Arg Leu Glu Thr Ala		3695
	3700	3705
		3710

Phe Lys Lys Leu Thr Thr Ala Asp Leu Ala Ser Val Val Pro Asp Asp
 3715 3720 3725
 Ile Ala Arg Asp Glu Ile Ala Val Arg Leu Ala Ala Leu Gly Ser Leu
 3730 3735 3740
 Trp Asn Gly Leu His Gly Asn Gly Leu Ser Gly Asp Ala Ala Gln Lys
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 His Gly Asp Ser Ile Val Glu Asp Ile Asp Ser Ala Asp Asp Asp Glu
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 Ile Phe Ala Phe Leu Asp Glu Ser Phe Gly Asp Ser
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<211> 1612

<212> PRT

<213> Streptomyces bikiniensis

<400> 26

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 Thr Thr Glu Leu His Lys Ala Thr Glu Arg Leu Lys Glu Val Glu Gln
 20 25 30
 Arg Ala His Glu Pro Val Ala Ile Val Gly Met Gly Cys Arg Phe Pro
 35 40 45
 Gly Gly Ala Ser Ser Pro Glu Leu Trp Asp Leu Val Ala Ala Glu
 50 55 60
 Thr Asp Ala Val Ser Pro Phe Pro Val Asp Arg Gly Trp Asp Val Thr
 65 70 75 80
 Gly Leu Tyr Asp Pro Asp Pro Asp Ala Ala Gly Arg Ala Tyr Val Arg
 85 90 95
 Glu Gly Gly Phe Leu His Asp Ala Gly Glu Phe Asp Ala Gly Phe Phe
 100 105 110
 Gly Ile Ser Pro Arg Glu Ala Leu Ala Met Asp Pro Gln Gln Arg Leu
 115 120 125
 Leu Leu Glu Thr Ser Trp Glu Ala Leu Glu Arg Ala Gly Ile Asp Pro
 130 135 140
 His Thr Leu Arg Gly Thr Arg Thr Gly Val Tyr Met Gly Ala Trp Asn
 145 150 155 160
 Gly Gly Tyr Ala Glu Gly Ile Pro Gln Pro Thr Ala Glu Leu Glu Ala
 165 170 175
 Gln Leu Leu Thr Gly Gly Val Val Ser Phe Thr Ser Gly Arg Val Ser
 180 185 190
 Tyr Leu Leu Gly Leu Glu Gly Pro Ala Val Thr Val Asp Thr Ala Cys
 195 200 205
 Ser Ser Ser Leu Val Ala Leu His Leu Ala Val Arg Ala Leu Arg Ser
 210 215 220
 Gly Glu Cys Asp Leu Ala Leu Ala Gly Gly Ala Thr Val Met Ser Thr
 225 230 235 240
 Pro Asp Val Phe Val Arg Phe Ser Arg Gln Arg Gly Val Ala Ala Asp
 245 250 255
 Gly Arg Cys Lys Ala Phe Ser Ala Ser Ala Asp Gly Phe Gly Pro Ala
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 Glu Gly Val Gly Val Leu Ala Val Glu Arg Leu Ser Asp Ala Val Arg
 275 280 285
 His Gly Arg Arg Val Leu Ala Val Val Arg Gly Ser Ala Val Asn Gln
 290 295 300
 Asp Gly Ala Ser Asn Gly Leu Thr Ala Pro Ser Gly Arg Ala Gln Ala

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Leu	Leu	Ile	Arg	Arg	Ala	Leu	Ala	Asp	Ala	Arg	Leu	Gly	Val	Ala
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Val	Asp	Val	Val	Glu	Gly	His	Gly	Thr	Gly	Thr	Arg	Leu	Gly	Asp
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Ile	Glu	Ala	Gln	Ala	Leu	Leu	Ala	Thr	Tyr	Gly	Gln	Arg	Asp	Ala
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Arg	Pro	Leu	Arg	Leu	Gly	Ser	Leu	Lys	Ser	Asn	Val	Gly	His	Thr
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385					390					395				400
His	Gly	Val	Leu	Pro	Lys	Thr	Leu	His	Val	Asp	Glu	Pro	Thr	Ala
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Val	Asp	Trp	Ser	Ala	Gly	Ala	Val	Ser	Leu	Leu	Arg	Glu	Gln	Glu
			420					425				430		
Trp	Pro	Glu	Val	Gly	Arg	Leu	Arg	Arg	Ala	Ala	Val	Ser	Ser	Phe
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Val	Ser	Gly	Thr	Asn	Ala	His	Val	Val	Val	Glu	Glu	Ala	Pro	Val
	450					455				460				
Glu	Asp	Gly	Glu	Ala	Val	Gly	Gly	Gly	Val	Pro	Leu	Ala	Val	Val
465					470					475				480
Val	Val	Val	Ser	Gly	Arg	Ser	Ala	Gly	Ala	Val	Ala	Glu	Leu	Ala
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Arg	Val	Ser	Glu	Val	Ala	Ala	Ser	Gly	Arg	Leu	Val	Asp	Val	Gly
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		515					520					525		
Ala	Gly	Asp	Ser	Ala	Glu	Leu	Asn	Ala	Gly	Leu	Asp	Ala	Val	Ala
	530					535					540			
Gly	Val	Pro	Ser	Pro	Gly	Val	Val	Ser	Gly	Val	Ala	Ser	Gly	Glu
545					550					555				560
Gly	Arg	Ser	Val	Phe	Val	Phe	Pro	Gly	Gln	Gly	Thr	Gln	Trp	Ala
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Met	Ala	Leu	Gly	Leu	Trp	Ala	Glu	Ser	Ser	Val	Phe	Ala	Glu	Ser
			580					585					590	
Ala	Arg	Cys	Glu	Ala	Ala	Phe	Val	Gly	Leu	Val	Asp	Trp	Arg	Leu
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Gln	Val	Leu	Ser	Asp	Gly	Ser	Ala	Leu	Glu	Arg	Val	Glu	Val	Val
	610					615					620			
Pro	Ala	Ser	Phe	Ala	Val	Met	Val	Ser	Leu	Ala	Glu	Leu	Trp	Arg
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Leu	Gly	Val	Val	Pro	Asp	Ala	Val	Val	Gly	His	Ser	Gln	Gly	Glu
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Ala	Ala	Ala	Val	Val	Ala	Gly	Gly	Leu	Ser	Leu	Glu	Asp	Gly	Ala
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Val	Val	Val	Leu	Arg	Ala	Arg	Leu	Ile	Gly	Arg	Glu	Leu	Ala	Gly
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Gly	Gly	Met	Ala	Ser	Val	Ala	Leu	Pro	Val	Ala	Val	Val	Glu	Glu
	690					695				700				
Leu	Ala	Gly	Trp	Ala	Gly	Arg	Leu	Gly	Val	Ala	Val	Val	Asn	Gly
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Ser	Ala	Thr	Val	Val	Ala	Gly	Asp	Val	Asp	Ala	Val	Ala	Glu	Phe
				725					730				735	
Ala	Ala	Cys	Glu	Val	Glu	Gly	Val	Arg	Ala	Arg	Val	Leu	Pro	Val
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Tyr	Ala	Ser	His	Ser	Ala	His	Val	Glu	Asp	Leu	Lys	Ala	Glu	Leu
		755					760					765		

Gln	Ile	Leu	Ala	Gly	Ile	Gly	Pro	Val	Thr	Gly	Gly	Ile	Pro	Phe	Tyr
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Ser	Thr	Ser	Glu	Ala	Ala	Gln	Ile	Asp	Thr	Ala	Gly	Leu	Asp	Ala	Gly
785				790						795					800
Tyr	Trp	Phe	Gly	Asn	Leu	Arg	Arg	Pro	Val	Arg	Phe	Gln	Glu	Thr	Val
			805						810					815	
Glu	Arg	Leu	Leu	Ala	Asp	Gly	Phe	Arg	Val	Phe	Val	Glu	Cys	Gly	Ala
		820						825					830		
His	Pro	Val	Leu	Thr	Gly	Ala	Val	Gln	Glu	Thr	Ala	Glu	Ser	Thr	Gly
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Val	Ser	Trp	Pro	Ala	Leu	Phe	Glu	Gly	Thr	Gly	Ala	Arg	Thr	Val	Asp
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Pro	Pro	Ala	Ala	Pro	Ile	Glu	Thr	Ala	Ala	Ala	Ser	Gly	Ile	Glu	Ser
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Trp	Arg	Tyr	Arg	Val	Ala	Trp	Lys	Ser	Leu	Ser	Leu	Ser	Glu	Ser	Ser
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Leu	Trp	Val	Val	Thr	Arg	Gly	Ala	Val	Ala	Val	Ser	Pro	Ala	Glu	Arg
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Pro	Ser	Ser	Ala	Gly	Ala	Gln	Val	Trp	Gly	Leu	Gly	Arg	Cys	Ala	Ala
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Leu	Glu	Leu	Pro	Thr	Arg	Trp	Gly	Gly	Met	Val	Asp	Leu	Pro	Pro	Ala
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Glu	Thr	Cys	Ala	Glu	Asp	Gln	Val	Ala	Leu	Arg	Ala	Ser	Gly	Ala	Tyr
			1125						1130					1135	
Gly	Arg	Arg	Leu	Leu	Pro	Ala	Ser	Ser	Pro	Ser	Val	Ser	Val	Pro	Arg
		1140						1145					1150		
Thr	Ala	Lys	Ser	Gly	Tyr	Gln	Pro	Arg	Gly	Thr	Val	Leu	Val	Thr	Gly
	1155					1160						1165			
Gly	Thr	Gly	Ala	Leu	Gly	Gly	His	Leu	Ala	Arg	Trp	Leu	Ala	Arg	Asn
	1170					1175					1180				
Gly	Ala	Glu	His	Ile	Val	Leu	Ala	Gly	Arg	Arg	Gly	Glu	Gly	Ala	Pro
1185				1190						1195					1200
Gly	Ala	Ala	Glu	Leu	Ser	Ala	Glu	Leu	Lys	Glu	Leu	Gly	Ala	Glu	Val
			1205						1210					1215	
Thr	Val	Ala	Ala	Cys	Asp	Val	Ala	Asp	Arg	Asn	Ala	Leu	Arg	Asp	Met

Met	Ala	Leu	Ser	Gln	Glu	Lys	Val	Leu	Glu	Ala	Leu	Arg	Thr	Ser	Val	1	5	10	15
Lys	Asp	Ala	Glu	Arg	Leu	Arg	Lys	Arg	Asn	Arg	Glu	Leu	Leu	Ala	Ala	20	25	30	
Arg	His	Glu	Pro	Ile	Ala	Val	Val	Gly	Met	Ala	Cys	Arg	Tyr	Pro	Gly	35	40	45	
Gly	Val	Arg	Ser	Pro	Glu	Asp	Leu	Trp	Glu	Leu	Val	Val	Ser	Gly	Thr	50	55	60	
Asp	Ala	Val	Gly	Pro	Phe	Pro	Glu	Asp	Arg	Gly	Trp	Asp	Val	Glu	Arg	65	70	75	80
Ile	Tyr	Asp	Gln	Asp	Pro	Ser	Val	Pro	Gly	Thr	Thr	Tyr	Cys	Arg	Glu	85	90	95	
Gly	Gly	Phe	Leu	Tyr	Asp	Ala	Gly	Asp	Phe	Asp	Ala	Ala	Phe	Phe	Gly	100	105	110	
Ile	Gly	Pro	Arg	Glu	Ala	Thr	Val	Met	Asp	Pro	Gln	Gln	Arg	Gln	Leu	115	120	125	
Leu	Glu	Ala	Ser	Trp	Glu	Ala	Leu	Glu	Gln	Ala	Gly	Leu	Asp	Pro	Arg	130	135	140	
Ala	Leu	Arg	Gly	Ser	Gln	Gly	Gly	Val	Phe	Val	Gly	Ala	Ala	Asn	Gln	145	150	155	160
Gly	Tyr	Val	Pro	Gly	Asp	Ala	Ala	Ala	Ser	Gly	Arg	Leu	Pro	Glu	Gly	165	170	175	
Ser	Asp	Gly	Tyr	Leu	Leu	Thr	Gly	Asn	Ala	Asp	Ala	Val	Leu	Ser	Gly	180	185	190	
Arg	Ile	Ser	Tyr	Phe	Leu	Gly	Leu	Glu	Gly	Pro	Ser	Met	Thr	Val	Glu	195	200	205	
Thr	Ala	Cys	Ser	Ser	Ser	Leu	Val	Ala	Leu	His	Leu	Ala	Val	Gln	Ala	210	215	220	
Leu	Arg	Arg	Glu	Glu	Cys	Glu	Phe	Ala	Leu	Ala	Gly	Gly	Val	Ala	Val	225	230	235	240
Leu	Ala	Asn	Pro	Ala	Ala	Tyr	Val	Glu	Phe	Ala	Arg	Gln	Arg	Gly	Leu	245	250	255	
Ala	Pro	Asp	Gly	Arg	Cys	Lys	Ala	Phe	Asp	Asp	Ala	Ala	Asp	Gly	Thr	260	265	270	
Gly	Trp	Ala	Glu	Gly	Val	Gly	Val	Leu	Val	Val	Glu	Arg	Leu	Ser	Asp	275	280	285	
Ala	Val	Arg	Lys	Gly	His	Arg	Val	Leu	Ala	Val	Val	Arg	Gly	Thr	Ala	290	295	300	
Val	Asn	Gln	Asp	Gly	Ala	Ser	Ser	Gly	Leu	Ser	Val	Pro	Asn	Gly	Pro	305	310	315	320
Ser	Gln	Gln	Arg	Val	Ile	Arg	Arg	Ala	Leu	Ala	Asp	Ala	Arg	Leu	Glu	325	330	335	
Ala	Gly	Gln	Ile	Asp	Ala	Val	Glu	Ala	His	Gly	Thr	Gly	Thr	Arg	Leu	340	345	350	
Gly	Asp	Pro	Ile	Glu	Ala	Gln	Ala	Leu	Leu	Asp	Thr	Tyr	Gly	Glu	Glu	355	360	365	
Arg	Ser	Pro	Glu	Arg	Pro	Leu	Trp	Val	Gly	Ser	Leu	Lys	Ser	Asn	Phe	370	375	380	
Gly	His	Ala	Gln	Ala	Ala	Ala	Gly	Val	Gly	Gly	Val	Ile	Lys	Thr	Val	385	390	395	400
Met	Ala	Leu	Arg	His	Gly	Leu	Leu	Pro	Arg	Thr	Leu	His	Val	Thr	Ser	405	410	415	
Pro	Thr	Arg	His	Val	Asp	Trp	Gly	Asp	Gly	Gln	Val	Arg	Leu	Leu	Thr	420	425	430	
Glu	Pro	Val	Asp	Trp	Pro	Arg	Thr	Gly	Ala	Pro	Arg	Arg	Ala	Ala	Val	435	440	445	
Ser	Ala	Phe	Gly	Val	Ser	Gly	Thr	Asn	Gly	His	Ile	Ile	Leu	Glu	Glu				

450	455	460
Ala Pro Pro Pro Thr Arg	Pro Glu Ala Val Arg	Gln Ala Gly Glu Arg
465	470	475
Arg Pro Val Leu Val Pro	Trp Thr Leu Ser Gly	Arg Thr Arg Pro Ala
485	490	495
Leu Cys Arg Gln Ala Ala	Arg Leu Ala His Leu	Glu Gln His Pro
500	505	510
Asp Leu Asp Pro Leu Asp	Val Gly Phe Ser Leu	Ala Thr Thr Arg Thr
515	520	525
His Phe Glu His Arg Ala	Val Leu Leu Ala Asp	Ala Ala Thr Glu Gly
530	535	540
Gly Ser Arg Ala Asp Ala	Leu Gly Ala Leu Arg	Ala Ile Ala Glu Asp
545	550	555
Arg Asp Pro Gly Gly Ala	Val Arg Asp Thr Ala	Arg Gly Glu Gly Arg
565	570	575
Ile Ala Phe Leu Phe Cys	Gly Gln Gly Ser Gln	Arg Pro Gly Met Ala
580	585	590
Glu Gln Leu Tyr Ala Gln	Tyr Pro Ala Phe Ala	Arg Glu Leu Asp Thr
595	600	605
Ile Ala Thr His Leu Asp	Ala His Leu Asp Arg	Pro Leu Ala Thr Val
610	615	620
Met Phe Ala Pro Ala Gly	Thr Ala Glu Ala Ala	Leu Leu Asp Gly Thr
625	630	635
Gln Tyr Ala Gln Ala Ala	Leu Phe Ala Val Glu	Val Ala Leu Phe Arg
645	650	655
Leu Phe Glu Gly Trp Gly	Leu Arg Pro Asp Val	Leu Leu Gly His Ser
660	665	670
Val Gly Glu Leu Ala Ala	Ala His Val Ala Gly	Val Phe Gly Pro Ala
675	680	685
Asp Ala Cys Ser Leu Val	Ala Ala Arg Gly Arg	Leu Met Gln Glu Leu
690	695	700
Pro Ala Gly Gly Ala Met	Leu Ser Val Arg Ala	Ala Glu His Glu Val
705	710	715
Arg Glu Leu Ile Ala Gly	Gln Glu Asp Arg Ile	Ala Val Ala Ala Val
725	730	735
Asn Gly Pro Arg Ser Val	Val Val Ser Gly Asp	Glu Asp Ala Val Ser
740	745	750
Ala Leu Ala Glu Glu Leu	Thr Glu Tyr Gly Val	Arg Thr Lys Arg Leu
755	760	765
Asn Val Ser His Ala Phe	His Ser Pro Arg Leu	Asp Ser Met Leu Glu
770	775	780
Thr Phe Arg Arg Val Ala	Glu Thr Val Glu Tyr	Arg Glu Pro Thr Leu
785	790	795
Asp Val Ile Ser Gly Leu	Thr Gly Arg Pro Ala	Asp Ala Gly Glu Leu
805	810	815
Ala Thr Ala Asp Tyr Trp	Val Arg Gln Ala Arg	Glu Thr Val Arg Phe
820	825	830
His Asp Gly Val Arg Ala	Ala His Ala Arg Gly	Val Ser Thr Phe Val
835	840	845
Glu Leu Gly Pro Asp Gly	Val Leu Cys Gly Leu	Ala Leu Glu Thr Leu
850	855	860
Ala Glu Glu Thr Asp Gly	Glu Ala Ala Ala Glu	Thr Pro Gly Arg Ala
865	870	875
Arg Ala Ala Leu Val Pro	Val Met Arg Arg Glu	Arg Pro Glu Gly Ser
885	890	895
Thr Leu Leu Thr Ala Leu	Ala Thr Ala His Ala	Arg Gly Ala Glu Val
900	905	910

Asp	Trp	Ser	Arg	Phe	Tyr	Ala	Asp	Thr	Gly	Ala	Arg	His	Thr	Thr	Leu	915	920	925
Pro	Thr	Tyr	Ala	Phe	Gln	Arg	Gln	Arg	Phe	Trp	Leu	Glu	Thr	Ala	Ala	930	935	940
Pro	Ala	Ala	Pro	Ala	Ala	Gly	Gln	Gly	Ala	Gly	Pro	Ala	Asp	Pro	Gln	945	950	955
Asp	Ser	Thr	Gly	Pro	Ala	Ala	Arg	Pro	Thr	Leu	Thr	Glu	Gln	Asp	Leu	965	970	975
Leu	Leu	Leu	Val	Arg	Thr	Glu	Ala	Ala	Ala	Ala	Leu	Gly	His	Ala	Glu	980	985	990
Leu	Glu	Asp	Val	Pro	Ala	Asp	Ser	Leu	Phe	Gly	Asp	Ile	Gly	Phe	Asp	995	1000	1005
Ser	Leu	Ala	Ala	Ile	Glu	Leu	Gly	Ala	Ala	Leu	Thr	Gly	Ala	Thr	Gly	1010	1015	1020
Leu	Glu	Val	Pro	Ser	Ser	Leu	Val	Leu	Asp	His	Pro	Thr	Pro	Arg	Glu	1025	1030	1035
Leu	Ala	Ala	His	Leu	Ala	Ala	Ala	Arg	Thr	Ala	Ala	Asp	Ser	Asp	Asp	1045	1050	1055
Thr	Ser	Pro	Glu	Gly	Pro	Asp	Thr	Ala	Gly	Glu	Ser	Ser	Leu	Ser	Ala	1060	1065	1070
Met	Tyr	Arg	Arg	Ala	Val	Arg	Leu	Gly	Arg	Ala	Glu	Pro	Phe	Ile	Gly	1075	1080	1085
Thr	Leu	Ala	Glu	Leu	Ala	Ala	Phe	Arg	Pro	Val	Phe	Pro	Ala	Asp	His	1090	1095	1100
Thr	Leu	Ala	Asp	Gly	Glu	Thr	Val	Gly	Gln	Ala	Ala	Ala	Ala	Trp	Gln	1105	1110	1115
Pro	Ala	Pro	Val	Arg	Leu	Ala	Thr	Thr	Asp	Gly	Glu	Gly	Pro	Glu	Leu	1125	1130	1135
Ile	Cys	Cys	Ala	Gly	Thr	Ala	Val	Ala	Ser	Gly	Pro	Glu	Glu	Phe	Thr	1140	1145	1150
Ala	Leu	Ala	Ala	Ala	Leu	Gly	Asp	Arg	Leu	Thr	Val	Ser	Ala	Leu	Arg	1155	1160	1165
Gln	Pro	Gly	Phe	Arg	Ala	Asn	Glu	Leu	Leu	Pro	Gly	Ser	Leu	Asp	Gly	1170	1175	1180
Leu	Leu	Asp	Ala	Gln	Ala	Asp	Ala	Val	Leu	Arg	His	Thr	Gly	Asp	Arg	1185	1190	1195
Pro	Tyr	Ala	Leu	Leu	Gly	His	Ser	Ala	Gly	Gly	Ala	Leu	Ala	His	Ala	1205	1210	1215
Leu	Ala	Cys	Arg	Leu	Glu	Glu	Leu	Gly	Ala	Gly	Pro	Ala	Ala	Leu	Val	1220	1225	1230
Leu	Ala	Asp	Val	Tyr	Leu	Pro	Ser	Pro	Gly	Ala	Met	Gly	Val	Trp		1235	1240	1245
Arg	Asn	Glu	Met	Leu	Asp	Trp	Val	Met	Arg	Arg	Ser	Val	Val	Ser	Ile	1250	1255	1260
Asp	Asp	Ala	Arg	Leu	Thr	Ala	Met	Gly	Ala	Tyr	Asn	Gln	Met	Leu	Leu	1265	1270	1275
Glu	Trp	Thr	Pro	Arg	Pro	Thr	Lys	Ala	Pro	Val	Leu	Phe	Leu	Arg	Ala	1285	1290	1295
Thr	Glu	Pro	Val	Arg	Pro	Trp	Ser	Gly	Glu	Pro	Glu	Ser	Trp	Arg	Ala	1300	1305	1310
His	Trp	Asp	Gly	Gly	Asp	His	Thr	Ala	Val	Asp	Val	Pro	Gly	Thr	His	1315	1320	1325
Leu	Thr	Leu	Met	Thr	Glu	His	Ala	Arg	His	Leu	Ala	Ala	Thr	Leu	His	1330	1335	1340
Thr	Trp	Leu	Gly	Thr	Leu											1345		1350

<210> 28
 <211> 412
 <212> PRT
 <213> Streptomyces bikiniensis

<400> 28

Val	Thr	Thr	Gln	Trp	Thr	Thr	Pro	Ser	Val	Leu	Gly	Arg	Arg	Leu	Gln
1				5					10					15	
Arg	Thr	Tyr	Val	Gly	His	Trp	Phe	Ala	Gly	Thr	Gln	Gly	Asp	Pro	Tyr
			20					25					30		
Ala	Leu	Ile	Leu	Arg	Ala	Gln	Arg	Asp	Asp	Thr	Thr	Pro	Tyr	Glu	Glu
		35					40					45			
Asp	Val	Arg	Ala	Arg	Gly	Pro	Val	Phe	His	Ser	Glu	Val	Leu	Asp	Thr
	50					55					60				
Trp	Val	Ile	Thr	Asp	Gly	Ala	Leu	Ala	Arg	Ser	Val	Leu	Thr	Asp	Ala
65					70				75					80	
Arg	Phe	Gly	Gly	Leu	Thr	Arg	Ala	Gly	Gly	Arg	Tyr	Arg	Ala	Glu	Leu
				85					90					95	
Leu	Pro	Pro	Ala	Gly	Pro	Glu	Val	Gly	Pro	Ala	Arg	Ala	Gly	Val	Arg
			100					105					110		
Gly	Gly	Val	Arg	Ala	Asp	Ala	Asp	Pro	Ala	Val	Ser	Ala	Gln	Asp	Glu
		115					120					125			
Val	Val	Val	Glu	Ala	Leu	Ala	Glu	Gln	Leu	Ser	Arg	Thr	Leu	Leu	Gly
	130					135					140				
Gly	Leu	Gly	Asp	Asp	Phe	Asp	Leu	Val	Ala	Ala	Phe	Ala	Arg	Arg	Leu
145					150				155						160
Pro	Ala	Gln	Val	Leu	Ala	Glu	Phe	Leu	Gly	Leu	Pro	Ala	Ala	Ala	Arg
				165					170					175	
Ser	Arg	Phe	Glu	Glu	Leu	Leu	Ala	Gly	Cys	Ala	His	Ser	Leu	Asp	Ser
			180					185					190		
Arg	Leu	Cys	Pro	Gln	Thr	Leu	Asp	Ile	Thr	Arg	Thr	Gly	Leu	Gly	Ala
		195					200					205			
Ala	Ala	Glu	Leu	Arg	Glu	Leu	Leu	Ala	Arg	His	Leu	Gly	Gly	Ser	Gly
	210					215					220				
Pro	Arg	Ser	Ala	Gln	Ala	Ala	Val	Ser	Leu	Ala	Val	Glu	Val	Ala	Ala
225					230					235					240
Pro	Ala	Gly	Ala	Leu	Ile	Cys	Asn	Ala	Val	Glu	Ala	Leu	Ser	Ser	Ser
				245					250					255	
Pro	Gly	Gln	Trp	Asn	Ala	Leu	Arg	Gln	Asn	Pro	Glu	Lys	Ala	Asp	Ala
		260						265					270		
Val	Val	Ala	Glu	Thr	Trp	Trp	Arg	Arg	Pro	Pro	Val	Arg	Val	Glu	Ser
		275					280					285			
Arg	Ile	Ala	Gln	Glu	Asp	Val	Asp	Val	Ala	Gly	Val	Pro	Val	Pro	Ala
	290					295					300				
Asp	Gly	His	Val	Ala	Ile	Leu	Val	Ala	Ala	Ala	Gln	Arg	Asp	Pro	Ala
305					310				315						320
Ile	Thr	Pro	Ala	Pro	Thr	Lys	Asp	Asp	Thr	Gly	Thr	Pro	Gly	Gln	Gly
				325					330					335	
Asp	Cys	Gly	Val	Pro	Leu	Gly	Leu	Val	Gly	Asp	Ala	His	Ala	Thr	Ser
			340					345				350			
Ala	Ala	Arg	Thr	Val	Arg	Ala	Leu	Cys	Arg	Gly	Ala	Leu	Arg	Ala	Leu
		355					360				365				
Ala	Gln	Glu	Ala	Pro	Gly	Leu	Arg	Pro	Asn	Gly	Thr	Pro	Val	Arg	Leu
	370					375					380				
Arg	Arg	Ala	Pro	Val	Thr	Leu	Gly	His	Ala	Arg	Phe	Pro	Val	Ala	Arg
385					390					395					400

Thr Gly Arg Gly Thr Pro Thr Asp Ala Gly Ala Ala
405 410

<210> 29

<211> 425

<212> PRT

<213> Streptomyces bikiniensis

<400> 29

Met	Arg	Val	Leu	Met	Thr	Ser	Ile	Ala	His	Asn	Thr	His	Tyr	Tyr	His
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Leu	Val	Pro	Leu	Ala	Trp	Ala	Leu	Lys	Ala	Ala	Gly	His	Glu	Val	Arg
			20					25					30		
Val	Ala	Gly	Gln	Pro	Arg	Val	Thr	Asp	Ile	Ile	Thr	Gly	Ser	Gly	Leu
		35					40					45			
Thr	Ala	Val	Pro	Val	Gly	Asp	Asp	Glu	Asp	Met	Met	Glu	Leu	Phe	Ala
	50					55					60				
Glu	Ile	Gly	Gly	Asp	Ile	Thr	Pro	Tyr	Gln	Glu	Gly	Leu	Asp	Phe	Ala
65				70					75					80	
Glu	Glu	Arg	Pro	Glu	Ala	Arg	Ser	Trp	Glu	His	Leu	Leu	Gly	Gln	Gln
			85					90						95	
Thr	Val	Leu	Thr	Ser	Leu	Cys	Phe	Ala	Pro	Leu	Asn	Gly	Asp	Ser	Thr
		100						105					110		
Met	Asp	Asp	Ile	Val	Ala	Leu	Ala	Arg	Ser	Trp	Gln	Pro	Asp	Leu	Val
		115					120				125				
Ile	Trp	Glu	Pro	Phe	Thr	Phe	Ala	Gly	Ala	Val	Ala	Ala	His	Ala	Val
	130					135					140				
Gly	Ala	Ala	His	Ala	Arg	Val	Leu	Trp	Gly	Pro	Asp	Val	Ile	Gly	Arg
145				150					155					160	
Ala	Arg	Glu	Arg	Phe	Val	Glu	Ala	Lys	Ala	Gln	Gln	Ala	Pro	Glu	His
			165					170					175		
Arg	Glu	Asp	Pro	Met	Ala	Glu	Trp	Leu	Gly	Trp	Thr	Leu	Glu	Arg	Leu
	180						185					190			
Gly	Leu	Pro	Ala	Ala	Gly	Asp	Gly	Met	Glu	Glu	Leu	Leu	Asn	Gly	Gln
	195						200					205			
Trp	Val	Ile	Asp	Pro	Gly	Pro	Glu	Ser	Val	Arg	Leu	Asp	Leu	Arg	Glu
	210				215					220					
Pro	Ile	Leu	Pro	Met	Arg	Phe	Val	Pro	Tyr	Asn	Gly	Pro	Ala	Val	Val
225				230					235					240	
Pro	Gly	Trp	Leu	Ser	Glu	Lys	Pro	Lys	Arg	Pro	Arg	Val	Cys	Leu	Thr
			245					250					255		
Gln	Gly	Val	Ser	Gly	Arg	Glu	Thr	His	Gly	Lys	Asp	Ala	Val	Arg	Phe
		260					265					270			
Gln	Asp	Leu	Leu	Ala	Ala	Leu	Gly	Asp	Leu	Asp	Ile	Glu	Ile	Val	Ala
	275					280					285				
Thr	Leu	Asp	Ser	Thr	Gln	Arg	Glu	Asn	Leu	Thr	Glu	Val	Pro	Asp	Asn
	290				295					300					
Val	Arg	Ile	Val	Asp	Phe	Val	Ser	Met	Asp	Val	Leu	Leu	Pro	Ser	Cys
305				310					315					320	
Ala	Met	Ile	Ile	Tyr	His	Gly	Gly	Ala	Gly	Thr	Ser	Ala	Thr	Ala	Leu
			325				330						335		
Leu	His	Gly	Val	Pro	Gln	Val	Val	Ile	Gly	Ala	His	Trp	Asp	Val	Pro
		340				345					350				
Val	Arg	Ala	Arg	Gln	Leu	Asp	Asp	Leu	Gly	Ala	Gly	Ile	Phe	Ile	Arg
	355				360				365						
Pro	Glu	Asp	Leu	Asp	Ala	Ala	Thr	Leu	Arg	Ala	Ala	Val	Gln	Arg	Val

Ser Ala Arg Ile Ser Thr Glu Leu Leu Leu Val Leu Leu Gly Thr Ala
 20 25 30
 Ala Val Ile Trp Leu Leu Gly Arg Met Trp Ser Ile Val Trp Pro Leu
 35 40 45
 Val Ile Gly Leu Leu Ile Thr Thr Leu Thr Trp Pro Phe Ala Arg Leu
 50 55 60
 Leu Arg Arg Leu Gly Trp Pro Pro Ala Leu Ala Ala Ser Val Val Thr
 65 70 75 80
 Val Leu Phe Leu Ala Val Thr Ala Gly Thr Val Ala Leu Ile Ala Val
 85 90 95
 Pro Val Ala Ser Gln Ser Gly Glu Leu Ala Asp Gly Val Val Glu Gly
 100 105 110
 Ile Gln Arg Leu Arg Glu Trp Thr Ala Gly Pro Pro Leu Asn Ile Gly
 115 120 125
 Asp Asp Gln Ile Thr Gly Ala Leu Asp Thr Ala Thr Asp Arg Leu Gln
 130 135 140
 Asn Ser Val Gly Ser Leu Leu Thr Thr Leu Ala Thr Gly Val Gly Thr
 145 150 155 160
 Val Val Asn Gly Val Val Thr Ala Val Leu Ala Leu Phe Leu Met Phe
 165 170 175
 Phe Phe Leu Lys Asp Gly Pro Arg Phe Leu Pro Trp Leu Ala Arg Gln
 180 185 190
 Leu Pro Gly Arg Leu Ala Thr Asp Ala Thr Thr Ile Ala Glu Arg Gly
 195 200 205
 Trp Asp Thr Leu Gly Ala Phe Val Arg Ser Gln Ala Ala Val Gly Leu
 210 215 220
 Leu Asp Ala Val Leu Ile Gly Ile Gly Leu Trp Ile Leu Gly Val Pro
 225 230 235 240
 Leu Val Leu Pro Leu Ala Val Leu Thr Phe Val Ser Ala Phe Val Pro
 245 250 255
 Ile Ile Gly Ala Leu Leu Ala Gly Phe Val Ala Val Leu Ile Ala Leu
 260 265 270
 Val Ser Asn Gly Leu Thr Asp Ala Leu Ile Val Leu Ala Ile Ile Val
 275 280 285
 Val Val Gln Gln Leu Glu Gly Asn Val Phe Gln Pro Met Ile Gln Ser
 290 295 300
 Arg Gly Leu Gly Leu His Ala Ala Val Val Leu Leu Ala Val Thr Leu
 305 310 315 320
 Gly Gly Ser Leu Ala Gly Ile Val Gly Ser Leu Leu Ala Val Pro Val
 325 330 335
 Ala Ala Leu Val Ala Val Val Trp Gly Tyr Val Arg Glu Gln Leu Ser
 340 345 350
 Asp Pro Pro Gln Leu Asp Ala Asp Gly Gly Thr Arg Pro Gly Pro Asp
 355 360 365
 Gly Ala Pro Glu Ser Val Val Pro Ala Glu Ile Pro Ala Ser
 370 375 380

<210> 32

<211> 487

<212> PRT

<213> *Streptomyces bikiniensis*

<400> 32

Met Thr Ala Thr Thr Arg Arg Asp Pro Ala Ala Val Pro Asp Gly Gly
 1 5 10 15
 Thr Ala Glu Pro Val Pro Ser Pro Ala Ala Pro Asp Gly Arg Ala Ala

Leu Ala Pro Asp Pro Ala Pro
485

<210> 33

<211> 231

<212> PRT

<213> Streptomyces bikiniensis

<400> 33

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Met Thr Ala Tyr Val Ile Leu Glu Glu His Pro Leu Arg Pro Asp Glu
 1           5           10           15
Asp Gly Pro Leu Ile Glu Val Asp Arg Thr Ala Ala His Glu Ala Gly
          20           25           30
Val Gly Gly Glu Ser Thr Val Pro Val Arg Ser Gly Glu Arg His Ser
          35           40           45
Gln Arg Arg Leu Leu Glu Leu Leu Leu Ile Pro Ser Gly Asn Asn Val
 50           55           60
Ala Arg Leu Leu Ala Arg Trp Asp Ser Gly Ser Gln Ala Ala Phe Val
65           70           75           80
Thr Lys Met Arg Arg Ala Ala Val Arg Leu Gly Met Lys Asp Thr Val
          85           90           95
Tyr Thr Gly Ala Ser Gly Ile Glu Pro Thr Thr Thr Ser Thr Ala Ala
          100          105          110
Asp Gln Val Arg Leu Thr Arg Ala Ala Met Glu Asp Pro Val Phe Arg
          115          120          125
Ala Val Val Ala Thr Arg Glu Thr Thr Val Pro Gly Leu Gly Thr Ile
          130          135          140
Thr Asn Thr Asn Pro Leu Leu Asp Thr Pro Gly Val Leu Gly Val Lys
145          150          155          160
Thr Gly Ser Ser Thr Pro Ala Gly Gly Asn Leu Leu Trp Ala Tyr Glu
          165          170          175
Val Arg Val Gly Gly Ala Pro Arg Leu Leu Val Gly Ala Val Leu His
          180          185          190
Gln Arg Ala Asn Thr Thr Pro Ala Glu Gly Leu Arg Ala Ala Val Glu
          195          200          205
Ala Ala Arg Gly Leu Leu Thr Ala Val Arg Glu Arg Leu Ala Ala Ala
          210          215          220
Gly Thr Gln Gly Gly Glu Arg
225          230

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<210> 34

<211> 386

<212> PRT

<213> Streptomyces bikiniensis

<400> 34

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Met Ala Leu Thr Val Gly Val Leu Val His Asp Ser Val Leu Arg Arg
 1           5           10           15
Ser Leu His Glu Gly Ala Gly Arg Ala His Val Ala Leu Ala Thr Ala
          20           25           30
Leu Glu Asp Ala Asp Ala Ala Gly Glu Glu Gly Pro Arg Val Ser Pro
          35           40           45
Glu Glu Leu Pro Glu Ala Leu Leu Arg Gln Ile Glu His Gly Gly Glu
 50           55           60
Ala Thr Leu Tyr Glu Asp Gly Pro Pro Ala Pro Val Phe Arg Ala Ala

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65					70					75				80	
Arg	Arg	Glu	Gly	Gly	Lys	Leu	Tyr	Ala	Val	Glu	Val	Asp	Met	Thr	Ala
				85					90					95	
Asp	Leu	Leu	Thr	Arg	Gln	Ala	Leu	Asp	Arg	His	Met	Trp	Lys	Tyr	Ser
			100					105					110		
Leu	Leu	Thr	Leu	Gly	Val	Val	Val	Pro	Ala	Thr	Ala	Leu	Ala	Thr	Glu
		115					120					125			
Leu	Pro	Ala	Arg	Arg	Leu	Arg	Arg	Val	Ala	Arg	Thr	Ala	Arg	Arg	Ile
	130					135					140				
Thr	Ala	Gly	Asp	Leu	Asp	Ala	Arg	Thr	Gly	Thr	Val	Arg	Gly	Gly	Asp
145					150					155					160
Glu	Val	Ala	Glu	Ile	Ser	Ala	Val	Val	Asp	Ser	Met	Ala	Asp	Ser	Leu
				165					170					175	
Gln	Gln	Arg	Ile	Asp	Thr	Glu	Gln	Arg	Phe	Thr	Ala	Asp	Val	Ala	His
			180					185					190		
Glu	Leu	Arg	Thr	Pro	Leu	Met	Gly	Leu	Val	Thr	Ser	Ala	Glu	Leu	Leu
		195					200					205			
Pro	Glu	Gly	Glu	Val	Thr	Asp	Met	Val	Gln	Ser	Arg	Val	Arg	Val	Leu
	210					215					220				
Arg	Asp	Leu	Val	Glu	Asp	Leu	Leu	Glu	Val	Ser	Arg	Leu	Asp	Ala	Gly
225					230					235					240
Ala	Glu	Thr	Ala	Gln	Gly	Pro	Val	Asp	Leu	Gly	Ala	Leu	Val	Arg	
				245				250					255		
Asp	Ser	Val	Ala	Arg	Thr	Gly	Leu	Ala	Ala	Gln	Val	Thr	Arg	Gln	Gly
			260				265						270		
Ala	Ala	Val	Val	Glu	Ser	Asp	Pro	Arg	Arg	Leu	Asp	Arg	Ile	Val	Ser
		275					280					285			
Asn	Leu	Val	Val	Asn	Ala	His	Arg	His	Gly	Ala	Gly	Arg	Val	Glu	Val
	290					295					300				
Thr	Val	Ala	Gly	Arg	Thr	Val	Thr	Val	Arg	Asp	His	Gly	Pro	Gly	Phe
305					310				315						320
Pro	Ala	Asp	Leu	Leu	Ser	His	Gly	Pro	Gln	Arg	Phe	Arg	Thr	Gly	Ser
				325				330						335	
Ala	Glu	Arg	Gly	His	Gly	His	Gly	Leu	Gly	Leu	Thr	Ile	Ala	Ser	Gly
			340				345					350			
Gln	Ala	Arg	Val	Ile	Gly	Ala	Thr	Leu	Ala	Phe	Ala	Asn	Ala	Arg	Asp
		355				360					365				
Gly	Gly	Ala	Val	Ala	Thr	Leu	Ser	Leu	Pro	Glu	Asp	Gly	Gln	Thr	Ser
	370					375					380				
Glu	Ala														
385															

<210> 35

<211> 228

<212> PRT

<213> Streptomyces bikiniensis

<400> 35

Val	Thr	Val	Leu	Leu	Val	Glu	Asp	Asp	Glu	Val	Ile	Arg	Arg	Ser	Val
1				5					10					15	
Ala	Met	Ser	Leu	Glu	Arg	Tyr	Gly	Tyr	Arg	Val	Arg	Val	Ala	Ala	Asp
			20					25					30		
Gly	Leu	Thr	Gly	Leu	Glu	Leu	Phe	Arg	Glu	Gly	Arg	His	Asp	Leu	Val
		35				40					45				
Leu	Leu	Asp	Val	Met	Leu	Pro	Gly	Leu	Asp	Gly	Ile	Gly	Leu	Cys	Arg
	50					55					60				

Arg Ile Arg Glu Thr Ala Thr Asp Pro Ile Leu Met Met Ser Ala Arg
 65 70 75 80
 Gly Asp Ala Leu Asp Val Val Ser Gly Leu Glu Ala Gly Ala Asp Asp
 85 90 95
 Tyr Val Val Lys Pro Val Asp Thr Ala Val Leu Val Ala Arg Ile Arg
 100 105 110
 Ser Leu Leu Arg Arg Ala Ala Phe Val Ser Pro Ala Pro Gly Pro Ala
 115 120 125
 Asp Pro Ala Thr Pro Ala Gly Pro Leu Leu Phe Gly Asp Leu Ser Leu
 130 135 140
 Asp Pro Ala Ala Leu Glu Val Arg Arg Gly Gly Glu Arg Ile Ala Leu
 145 150 155 160
 Ala Pro Thr Glu Leu Arg Leu Leu Leu Gln Phe Ala Ala His Pro Gly
 165 170 175
 Ile Val Leu Asp Arg Gln Thr Leu Leu Arg Glu Val Trp Asp Tyr Gly
 180 185 190
 Trp Asp Gly Asp Thr Arg Val Val Asp Leu Cys Val Gln Arg Leu Arg
 195 200 205
 Lys Lys Ile Gly Ala Glu Arg Val Glu Thr Val Arg Gly Phe Gly Tyr
 210 215 220
 Lys Trp Lys Arg
 225

<210> 36

<211> 476

<212> PRT

<213> Streptomyces bikiniensis

<400> 36

Met Pro Glu Ser Arg Pro Ala Pro Glu Pro Thr Lys Thr Glu Asp Gly
 1 5 10 15
 Thr Asp Ala Arg Pro Asp Thr Pro Ala Arg Pro Gly Asp Thr His Pro
 20 25 30
 Val Asp Gln Met Leu Pro Pro Leu Lys Leu Phe Ser Ala Gly Leu Gln
 35 40 45
 His Val Ala Ala Met Tyr Ala Gly Val Val Ala Pro Pro Leu Val Val
 50 55 60
 Gly Ile Gly Val Gly Leu Ser Thr Ala Asp Ile Ala Phe Leu Met Ser
 65 70 75 80
 Ala Ser Leu Phe Thr Ser Gly Ile Ala Thr Leu Leu Gln Thr Leu Gly
 85 90 95
 Phe Trp Lys Val Gly Ala Arg Leu Pro Phe Val Asn Gly Val Ser Phe
 100 105 110
 Ala Gly Val Ala Pro Met Leu Ala Ile Ala Lys Ala Glu Gly Pro Asp
 115 120 125
 Asp Ala Leu Pro Val Ile Tyr Gly Ala Val Ile Val Ala Gly Val Phe
 130 135 140
 Gly Phe Leu Leu Ala Pro Phe Phe Cys Lys Leu Ile Arg Phe Phe Pro
 145 150 155 160
 Pro Val Val Thr Gly Thr Val Ile Thr Leu Ile Gly Val Ser Leu Leu
 165 170 175
 Pro Val Ala Phe Asn Trp Ala Gln Gly Gly Asn Ala Gln Ala Pro Asp
 180 185 190
 Tyr Gly Ser Leu Thr Tyr Ile Gly Leu Ala Thr Ala Thr Leu Leu Ile
 195 200 205
 Thr Val Val Leu Arg Arg Val Leu Thr Gly Phe Leu Lys Gln Ile Ser

210		215		220
Ile Leu Leu Gly Leu Val	Ala Gly Thr Leu Leu	Ser Leu Pro Leu Gly		
225	230	235	240	
Val Ala Asp Phe Ser	Ala Val Gly Asp Ala Asp	Val Ile Gly Leu Pro		
	245	250	255	
Thr Pro Phe His	Phe Gly Ala Pro Gln	Phe Ala Ala Ala	Ile Ile	
	260	265	270	
Ser Met Cys Ile Val Met	Leu Val Ser Met Thr	Glu Ser Thr Ala Asp		
	275	280	285	
Val Leu Ala Leu Gly Glu	Ile Val Glu Arg Pro	Ala Asp Glu Lys Thr		
	290	295	300	
Leu Ala Ala Ala Leu Arg	Ala Asp Gly Leu Gly	Thr Ala Leu Ser Pro		
305	310	315	320	
Leu Phe Asn Gly Phe	Ala Ala Ser Ala Phe	Ala Gln Asn Val Gly	Leu	
	325	330	335	
Val Ala Ile Thr Lys	Val Arg Ser Arg Phe	Val Val Ala Ala	Gly	
	340	345	350	
Gly Ile Leu Leu Leu Leu	Gly Leu Cys Pro Leu	Leu Ala Ser Val Val		
	355	360	365	
Ala Leu Ile Pro Gln Pro	Val Leu Gly Gly Val	Gly Ile Ala Leu Phe		
	370	375	380	
Gly Thr Val Ala Ala Ser	Gly Ile Gln Thr Leu	Ala Gly Ala Ala Leu		
385	390	395	400	
Glu Arg Gly Asp Asn	Val Leu Ile Val Ala	Ile Ser Leu Gly Ala	Gly	
	405	410	415	
Ile Ile Pro Ile Ala Ala	Pro Asp Phe Tyr His	Ala Phe Pro Glu Gly		
	420	425	430	
Ala Arg Ile Val Leu Asp	Ser Gly Ile Ser Thr	Gly Cys Val Val Ala		
	435	440	445	
Val Leu Leu Asn Leu Ala	Phe Asn His Leu Gly	Arg Arg Thr Asp Pro		
	450	455	460	
Ala Pro Glu Thr Leu Pro	Ala Pro Ala Ala His	His		
465	470	475		

<210> 37

<211> 238

<212> PRT

<213> Streptomyces bikiniensis

<400> 37

Met Pro Pro Ala Asp Asp	Pro Tyr Ala Leu Pro	Arg Phe Asp Pro Thr
1	5	10
Arg Ala Ala Ala Val Arg	Ala Gln Leu Gly Leu Thr	Leu Gly Gln Val
	20	25
Ala Trp Ala Val Thr Ala	Tyr Cys Gly His Pro	Ala His Pro Gly Leu
	35	40
Val Glu Ala Trp Glu Ala	Gly Thr Ala Thr Pro	Asp Asn Thr Gln Val
	50	55
Lys Ala Leu Ala Ala Ala	Leu Trp Cys Ser Pro	Val Asp Leu Val Glu
65	70	75
Glu Pro Gly Thr Leu Ala	Gln Cys Arg Thr Val	Ala Gly Leu Thr Val
	85	90
Asn Glu Thr Ala Thr Glu	Leu Gly Leu Thr Arg	Gly Gln Trp Glu Asp
	100	105
Ala Glu Arg Arg Asn Arg	Trp Gln Gly Thr Pro	Ala Gln Thr Asp Ala
	115	120
		125

Leu Leu Arg Val Leu Cys Pro Pro Pro Ala Cys Phe Val Ala Ala Cys
 130 135 140
 Gly Arg Thr Gly Arg Leu Arg Val Leu Leu Arg Glu Ala Ala Thr Thr
 145 150 155 160
 Trp Trp Pro Pro Tyr Val Gly Ala Leu Ser Arg Ile Val Pro Leu Asp
 165 170 175
 Pro Ala Val Leu Gly His Ala Leu Glu Arg Leu His Leu Thr Tyr Gln
 180 185 190
 Gln Trp Glu Gly Ala Ala Gly Gly Pro Pro Arg Gln Ala Ala Arg Ala
 195 200 205
 Glu Ala Arg Ala Ala Asp Phe Leu Glu His Ile Asp Leu His Leu Trp
 210 215 220
 His His Val Arg Glu Val Leu Asn Pro Ala Arg Pro Ala Ser
 225 230 235

<210> 38

<211> 612

<212> PRT

<213> *Streptomyces bikiniensis*

<400> 38

Val Ser Gln Gly Pro Ala Leu Leu Pro Arg Ala Thr Asp His Ala Ser
 1 5 10 15
 Pro Thr Pro Pro His Pro Val Asp Glu Ile Leu Pro Ala Arg Arg Met
 20 25 30
 Leu Pro Ala Ala Leu Gln His Val Ala Ser Met Tyr Ala Gly Leu Thr
 35 40 45
 Ala Pro Pro Leu Ile Ile Ser Ser Ala Leu Gly Leu Thr Pro Ala Gln
 50 55 60
 Leu Ser Ala Leu Leu Ala Ala Ala Leu Leu Ile Ala Gly Leu Gly Thr
 65 70 75 80
 Ile Ala Gln Thr Leu Gly Val Tyr Gly Val Gly Ala Gly Leu Pro Leu
 85 90 95
 Val Asn Gly Val Ser Phe Ala Val Val Ser Pro Ala Leu Ala Thr Ala
 100 105 110
 Ala Thr Gln Gly Arg Asp Gly Ala Leu Pro Ala Ile Phe Gly Ala Thr
 115 120 125
 Leu Val Ala Gly Leu Leu Cys Leu Leu Leu Ala Pro Val Phe Cys Arg
 130 135 140
 Leu Val Arg Phe Phe Pro Val Val Ser Gly Cys Val Ile Thr Leu
 145 150 155 160
 Val Gly Ile Ser Leu Leu Pro Val Ala Gly Thr Trp Ala Arg Gly Gly
 165 170 175
 Asp Ala Glu Ala Ala Gly Phe Gly Ser Pro Ala Asp Leu Ala Leu Ala
 180 185 190
 Ala Thr Thr Leu Val Ile Thr Leu Thr Val His Arg Met Leu Ser Gly
 195 200 205
 Arg Phe Leu Gly Arg Val Ala Ile Leu Ile Gly Met Leu Ala Gly Thr
 210 215 220
 Leu Ile Ala Ile Pro Leu Gly Lys Val Asp Leu Asp Pro Leu Ala Gln
 225 230 235 240
 Ala Pro Leu Phe Ala Leu Pro Thr Pro Phe Gly Phe Gly Thr Pro Gln
 245 250 255
 Phe Val Pro Thr Val Ile Ala Thr Ala Ala Val Val Met Ile Val Ser
 260 265 270
 Met Met Glu Ser Thr Ala Ala Leu Leu Ala Leu Gly Ala Val Ala Glu

Arg	Pro	Val	Arg	Asp	Arg	Thr	Ile	Ala	Gly	Ser	Leu	Arg	Ala	Leu	Gly
275	290					295					300				
Leu	Ala	Thr	Val	Leu	Gly	Val	Leu	Gly	Ser	Phe	Thr	Ser	Thr	Ser	
305					310					315					320
Tyr	Ala	Gln	Asn	Val	Gly	Leu	Val	Ser	Leu	Ser	Arg	Ile	Arg	Ser	Arg
				325					330					335	
Tyr	Val	Val	Thr	Leu	Cys	Gly	Ala	Val	Leu	Val	Leu	Met	Gly	Phe	Val
			340					345					350		
Pro	Val	Leu	Gly	Ser	Phe	Val	Ala	Leu	Val	Pro	Leu	Pro	Val	Leu	Gly
		355					360					365			
Gly	Ala	Gly	Val	Val	Phe	Phe	Gly	Ser	Val	Ala	Val	Thr	Gly	Ile	Arg
	370					375					380				
Thr	Leu	Ala	Lys	Ala	Ala	Leu	Gly	Thr	Gly	His	Asn	Ala	Val	Ile	Val
385					390					395					400
Ser	Val	Thr	Leu	Ala	Phe	Gly	Leu	Phe	Pro	Val	Leu	Asp	Pro	Asp	Phe
				405					410					415	
Tyr	Ala	Arg	Leu	Pro	Ala	Pro	Val	Ala	Thr	Val	Leu	Gly	Ser	Gly	Ile
			420					425					430		
Thr	Ala	Gly	Cys	Leu	Val	Ala	Val	Leu	Leu	Asn	Tyr	Leu	Leu	Asn	His
		435					440					445			
Leu	Gly	Arg	Gly	Thr	Glu	Ala	Asp	Pro	Asp	Ala	Ile	Ser	Ala	Glu	Gln
	450					455					460				
Val	Thr	Ala	Leu	Asp	Thr	Ala	Asp	Thr	Val	Leu	Gly	Pro	Lys	Arg	Ser
465					470					475					480
Ser	Asp	Trp	Thr	Pro	Phe	Gln	Pro	Ser	Gly	Ser	Pro	Ser	Gly	Thr	Pro
				485					490					495	
Asp	His	Gly	Arg	His	Thr	Arg	Gly	Thr	Ala	Arg	Pro	Ala	Pro	Ala	Trp
			500					505					510		
Pro	Tyr	Val	Thr	Gly	Pro	Val	Asp	Pro	Thr	Asp	Thr	Gly	Arg	His	His
		515					520					525			
Arg	Pro	His	Glu	Val	Pro	Ala	Pro	Pro	His	Arg	Pro	Asp	Glu	Val	Pro
	530					535					540				
Pro	Pro	Leu	His	Pro	Ser	Ala	Ala	His	Glu	Gly	Glu	Pro	Pro	Pro	Ala
545					550					555					560
Val	Thr	Glu	Asn	Ala	Val	Phe	Pro	Gly	Pro	Leu	His	Pro	Leu	His	Pro
				565					570					575	
Leu	His	Pro	Arg	Pro	Thr	Gly	Arg	Pro	Asp	Arg	Pro	Arg	Gln	Arg	His
			580					585					590		
Ser	Ala	Glu	Ala	Asp	Pro	Trp	Gln	His	Pro	Gln	Thr	Pro	Ser	Ala	Ser
		595					600					605			
Gly	Asp	Ser	Gln												
	610														

<210> 39

<211> 223

<212> PRT

<213> Streptomyces bikiniensis

<400> 39

Met	Thr	Thr	Val	Ser	Ala	Ala	Arg	His	Arg	Ala	Gly	Gly	Ser	Pro	Arg
1				5					10					15	
Gly	Gly	Thr	Ser	Arg	Pro	Gly	Pro	Asp	Glu	Arg	Ile	Ala	Gln	Val	Val
			20					25					30		
Ala	Glu	Ala	Leu	Gly	Ser	Ala	Arg	Thr	Val	Leu	Asp	Pro	Asp	Ala	Leu
		35					40						45		

Pro Gly Leu Gly Thr Thr Arg Leu Pro Phe Gly Asp Gly Arg Phe Asp
 50 55 60
 Ala Ala Met Met Leu Cys Asn Ala Pro Gly Val Pro Asp Ala Leu Ser
 65 70 75 80
 Arg Leu Gly Glu Leu Arg Arg Val Thr Arg Gly Pro Val Val Val Leu
 85 90 95
 Ala Thr Asp Pro Ser Arg Val Arg Ser Phe Trp Leu Asp Arg Tyr Ala
 100 105 110
 Pro Glu Val Leu Ala Val Glu Ala Arg Arg His Pro Pro Ile Ala Asp
 115 120 125
 Leu Thr Ala Val Leu Gly Gly Ser Ala Glu Val Arg Ser Val Pro Val
 130 135 140
 Pro Leu Asp Cys Thr Asp Thr Phe Asp Glu Ala Tyr Tyr Gly Arg Pro
 145 150 155 160
 Glu Lys Leu Leu Asp Pro Ser Ala Arg Gln Ala Gly Ser Ala Trp Ser
 165 170 175
 Phe Val Asp Asp Arg Val Arg Glu Glu Phe Asp Thr Thr Leu Arg Arg
 180 185 190
 Glu Leu Arg Ser Gly Glu Trp Asp Glu Arg Phe Gly His Leu Arg Arg
 195 200 205
 Arg Pro Val Tyr Glu Gly Ser Leu Val Ile Val Arg Ala Val Pro
 210 215 220

<210> 40

<211> 251

<212> PRT

<213> Streptomyces bikiniensis

<400> 40

Met Thr Thr Gly Thr Asp Ser Thr Thr Trp Phe Arg Arg Tyr Ser Ser
 1 5 10 15
 Thr Pro Ala Pro Arg Arg Arg Leu Ala Val Leu Pro His Ala Gly Gly
 20 25 30
 Ser Ala Ser Phe Phe His Ala Trp Gly Ser Ala Phe Gly Gly Asp Thr
 35 40 45
 Glu Val Leu Val Ala Gln Tyr Pro Gly Arg Gln Glu Arg Phe Asn Glu
 50 55 60
 Pro Phe Val Asp Arg Met Asp Val Leu Ala Asp Arg Val Thr Ala Ala
 65 70 75 80
 Leu Leu Pro Leu Ala Asp Val Pro Leu Thr Leu Phe Gly His Ser Met
 85 90 95
 Gly Ala Ser Leu Ala Tyr Glu Val Ala Leu Arg Leu Glu Glu Arg His
 100 105 110
 Arg Val Thr Pro Ala Ala Leu His Val Ser Ser Arg Lys Ala Pro His
 115 120 125
 Arg Leu Thr Pro Leu Asp Leu His Arg Lys Gly Asp Asp Glu Leu Val
 130 135 140
 Ala Val Leu Arg Gly Leu Gly Gly Thr Asp Thr Ala Leu Leu Asp Asp
 145 150 155 160
 Pro Asp Ile Arg Gln Leu Val Leu Pro Ala Val Arg Ala Asp Phe Thr
 165 170 175
 Val Val Ser Thr Tyr Gly Pro Arg Val Pro Thr Ala Val Gly Cys Pro
 180 185 190
 Val His Ala Trp Ile Gly Asp Thr Asp Pro Asn Val Ala Val Gly Asp
 195 200 205
 Met Asp Ala Trp Ala Asp Val Ala Pro Glu Gly Phe Arg Val Arg Val

210		215		220											
Leu	Pro	Gly	Gly	His	Phe	Tyr	Leu	Leu	Gln	Gln	His	Glu	Thr	Leu	Met
225					230					235					240
Arg	Glu	Leu	Ser	Gly	His	Leu	Ala	Gly	Asp	Arg					
				245					250						

<210> 41

<211> 316

<212> PRT

<213> Streptomyces bikiniensis

<400> 41

Met	Asp	His	Arg	Arg	Ala	Arg	Ala	Ala	Leu	Pro	Leu	Ser	Arg	His	Val
1				5					10					15	
Arg	Asp	Gly	Asp	Ala	Pro	Ser	Gly	Thr	Ala	Ala	Leu	Ala	Gly	Asp	Thr
			20					25					30		
Gly	Arg	Arg	Ala	Ala	Pro	Arg	Cys	Thr	Asp	Pro	Pro	Glu	Arg	Ala	Ala
		35					40					45			
Arg	Val	Gly	Gln	Gly	Pro	Gly	Asp	Arg	Gly	Ala	Arg	Arg	Arg	Val	Pro
	50					55					60				
Arg	Ala	Ala	Asp	Arg	Pro	Leu	Ala	Ala	Pro	Pro	Ala	Arg	Leu	Ala	Pro
65					70					75					80
Gly	Pro	Leu	Ser	Ala	Gly	Arg	Pro	Gln	Pro	Gly	Gln	His	Pro	Gly	Thr
				85				90						95	
Gly	Gly	Val	His	Ala	Arg	Ala	Gly	Gly	Arg	Gly	Ala	Pro	Val	Arg	Leu
			100					105					110		
His	Ala	Gly	Gly	Ala	Gly	Ala	Gly	Ala	Gly	Arg	Val	Glu	Gly	Thr	Pro
		115					120					125			
Ala	Ala	Gly	Pro	His	Arg	Glu	Pro	Gly	Val	Val	Arg	Arg	Pro	Arg	Gly
	130					135					140				
Leu	Ala	Val	His	Arg	Gly	Arg	Pro	Arg	Asp	Arg	Arg	Ala	Gly	Ala	Asp
145					150				155					160	
Arg	Gly	Pro	Arg	Arg	Gly	Ala	Pro	His	Gly	Ala	Asp	Ala	Gly	Arg	Gly
				165				170					175		
Val	Arg	Pro	Asp	Thr	Gly	Leu	Pro	Gln	Val	Ala	Ala	Pro	Ala	Ala	Arg
		180						185					190		
Gly	Ala	Asp	Arg	Ala	Ala	Asp	Arg	Leu	Val	His	Ala	Gly	Pro	Ala	Gly
	195						200					205			
Arg	Ala	Gln	Arg	Arg	Arg	Gly	Gly	Gly	His	Pro	Gly	Gly	Ala	Ala	Pro
	210					215					220				
Pro	Gly	Pro	Asp	Gly	Glu	Arg	Leu	Gly	Arg	Leu	Leu	Pro	Arg	Pro	Gly
225					230					235					240
Pro	Ala	Val	Arg	Arg	Gln	Gln	Pro	Glu	Ala	Gly	Ile	Gly	Arg	Trp	Ser
				245				250						255	
Gly	Arg	Arg	Gly	Arg	Arg	Phe	Gly	Arg	His	Gly	Arg	Arg	His	Arg	Asp
			260					265					270		
Arg	Arg	Gly	Thr	Ala	Glu	Leu	Gly	His	His	Arg	Pro	Glu	Val	Gly	Ser
		275					280					285			
Gly	Thr	Val	Gln	Asp	Arg	Asp	Val	His	Gly	Pro	Arg	Glu	Asp	Arg	Val
	290					295					300				
Arg	Asp	His	Gly	His	Arg	Cys	Arg	Glu	Leu	Pro	Gly				
305					310					315					

<210> 42

<211> 240

<212> PRT

<213> Streptomyces bikiniensis

<400> 42

Met	Phe	Arg	Thr	Glu	Glu	Lys	Arg	Pro	Val	Ala	Thr	Gly	Thr	Thr	Ala
1				5					10					15	
His	Asp	Ala	Val	Arg	Gly	His	Pro	Asp	Ala	His	Ala	Ala	Gly	Phe	Gly
			20					25					30		
Arg	Pro	Arg	Arg	Val	Thr	Val	Ala	Val	Tyr	Ala	Ala	Asp	Pro	Val	Leu
			35				40					45			
Arg	Val	Gly	Val	Val	Gln	Gln	Leu	Arg	Gln	Arg	Pro	Glu	Thr	Glu	Leu
	50					55					60				
Val	Asp	Asp	Ala	Asp	Ala	Glu	Asn	Ala	Gln	Val	Ser	Leu	Val	Val	Val
65					70				75						80
Asp	Ala	Leu	Asp	Asp	Asp	Val	Thr	Ala	Leu	Leu	Thr	Arg	Leu	Ser	Tyr
				85					90					95	
Asn	Gly	Ala	Thr	Arg	Ala	Gly	Leu	Val	Ile	Gly	Thr	Leu	Gly	Val	Gly
			100					105					110		
Ala	Leu	Gln	Arg	Val	Val	Glu	Cys	Gly	Val	Ser	Ala	Val	Leu	Arg	Arg
		115					120					125			
Ala	Glu	Ala	Asp	Gln	Asp	Gln	Leu	Val	Gln	Leu	Val	Leu	Ala	Val	Ala
	130					135					140				
Asn	Gly	Glu	Gly	Val	Leu	Pro	Gly	Asp	Leu	Leu	Gly	Glu	Leu	Leu	Gly
145					150				155						160
His	Val	Gly	Ser	Leu	Arg	Arg	Ala	Ala	Leu	Asp	Pro	Gly	Ala	Leu	Pro
				165					170					175	
Leu	Ser	Thr	Leu	Thr	Ser	Arg	Glu	Ala	Glu	Met	Leu	Arg	Leu	Val	Ser
			180					185					190		
Glu	Gly	Leu	Asp	Thr	Ala	Ala	Ile	Ala	Arg	Lys	Thr	Ser	Tyr	Ser	Glu
		195					200					205			
Arg	Thr	Val	Lys	Asn	Val	Leu	His	Glu	Ile	Thr	Thr	Arg	Leu	Gln	Leu
	210					215					220				
Arg	Asn	Arg	Ala	His	Ala	Val	Gly	Tyr	Ala	Leu	Arg	Asn	Gly	Leu	Ile
225					230					235					240

<210> 43

<211> 1066

<212> PRT

<213> Streptomyces bikiniensis

<400> 43

Met	Lys	Thr	Ala	Gly	Pro	Gly	Gly	Arg	His	Arg	Arg	Gly	Arg	Leu	Ala
1				5					10					15	
Ser	Ala	Leu	Leu	Leu	Val	Pro	Leu	Leu	Gly	Ala	Thr	Gly	Val	Ala	
			20					25				30			
Gly	Pro	Asp	Asp	Pro	Arg	Thr	Ala	Ala	Ala	Ala	Ala	Asp	Ala	Ala	Glu
		35					40					45			
Thr	Thr	Arg	Ile	Ala	Tyr	Ala	Gly	Thr	Gly	His	Arg	Ser	Leu	Gly	Glu
	50					55				60					
Pro	Ala	Ser	Thr	Asp	Ser	Ser	Thr	Pro	Leu	Phe	Gly	Ala	Gly	Pro	Thr
65					70				75						80
His	Tyr	Asp	Thr	Asp	Pro	Ser	Ala	Leu	Gly	Asp	Arg	Leu	Val	Phe	Ala
				85					90					95	
Ser	Arg	Arg	Asp	Glu	Lys	His	Pro	Gln	Ile	Tyr	Leu	Arg	Gly	Ala	Asp
			100					105					110		
Gly	Gly	Val	Leu	Arg	Leu	Thr	Ser	Gly	Leu	Asp	Ala	Ala	Arg	Pro	Arg

Asn	Arg	Lys	Asn	Gly	Gly	Gly	Arg	Ile	Asp	Glu	Arg	Asn	Gly	Leu	Leu	
			580					585					590			
Leu	Thr	Thr	Leu	Ser	Gly	Asp	Ala	Cys	Gln	Val	Leu	Leu	Pro	Thr	Ala	
		595					600					605				
Ala	Arg	Gly	Gln	Asp	Gly	Ala	Cys	Glu	Arg	Glu	Leu	Pro	Asp	Thr	Thr	
	610					615					620					
Leu	Thr	Gly	Pro	His	Gln	Pro	Arg	Asp	Ala	Ala	Trp	Thr	Ala	Asp	Gly	
625					630					635					640	
Lys	Arg	Leu	Val	Phe	Ser	Ser	Arg	Ala	Ala	Ala	Ala	Val	Asn	Ser	Pro	
			645						650					655		
Glu	Lys	Leu	Asn	Val	Leu	Asp	Val	Gly	Ser	Gly	Asp	Ile	Thr	Pro	Leu	
			660					665					670			
Thr	Ala	Glu	Leu	Ala	Gly	Arg	Gln	Lys	Glu	Pro	Thr	Val	Gln	Gln	Ser	
		675					680						685			
Val	Asp	Leu	Ala	Val	Glu	Ala	Pro	Ala	Thr	Thr	Pro	Asp	Val	Thr	Val	
		690				695					700					
Gly	Ala	Ser	Gly	Thr	Val	Thr	Val	His	Val	Val	Asn	His	Gly	Pro	Ala	
705					710					715					720	
Ala	Ser	Pro	Gly	Thr	Arg	Leu	Thr	Val	Val	Pro	Pro	Ser	Gly	Val	Arg	
			725						730					735		
Ile	Thr	Gly	Ile	Glu	Trp	Pro	Gly	Gly	Thr	Cys	Asp	Ala	Ala	Ser	Leu	
			740					745					750			
Gln	Cys	Asp	Leu	Gly	Val	Val	Glu	Ala	Gly	Ala	Gln	Val	Pro	Val	Asp	
		755					760					765				
Val	Thr	Leu	Thr	Gly	Val	Thr	Ala	Gly	Asp	Ala	Pro	Val	Asp	Trp	Ser	
		770				775					780					
Val	Thr	Gly	Ala	Val	Leu	Asp	Pro	Arg	Pro	Gly	Asp	Asn	Asp	Gly	Arg	
785					790					795					800	
Ser	Val	Ile	Pro	Val	Arg	Glu	Ala	Pro	Pro	Thr	Pro	Thr	Pro	Thr	Pro	
				805					810					815		
Thr	Pro	Thr	Pro	Thr	Pro	Thr	Pro	Thr	Pro	Thr	Pro	Thr	Pro	Thr	Pro	
			820					825					830			
Thr	Arg	Thr	Pro	Thr	Pro	Thr	Pro	Thr	Pro	Thr	Arg	Pro	Pro	Gln	Pro	
		835					840					845				
Pro	Ala	Pro	Lys	Ala	Gly	Pro	Gly	Val	Arg	Ile	Thr	Val	Gln	Pro	Glu	
	850					855					860					
Pro	Gly	Tyr	Val	Gly	Gly	Arg	Val	Val	Val	Thr	Tyr	Ser	Val	Arg	Asn	
865				870						875					880	
Gly	Arg	Asn	Ala	Leu	Ala	Thr	Gly	Leu	Arg	Leu	Arg	Ile	Gly	Leu	Pro	
				885					890					895		
Ala	Gly	Val	Pro	His	Gly	Gly	Leu	Pro	Ala	Gly	Cys	Asp	Arg	Asn	Gly	
			900					905					910			
Ala	Cys	Ala	Leu	Pro	Asp	Leu	Thr	Pro	Gly	Thr	Thr	Ala	Val	Leu	Arg	
		915					920					925				
Val	Val	Leu	Ser	Pro	Lys	Lys	Ala	Met	Thr	Ala	Arg	Val	Thr	Ala	Val	
		930				935					940					
Leu	Asp	Thr	Thr	Gly	Thr	Asp	Ala	Asp	Arg	Ser	Asp	Asn	Thr	Ala	Arg	
945					950					955					960	
Glu	Arg	Leu	Arg	Val	Leu	Gln	Pro	Arg	Ile	Val	Ala	Val	Pro	Asp	Ile	
				965					970					975		
Gly	Lys	Pro	Gly	Phe	Val	Thr	Ser	Val	Arg	Gly	Val	Asp	Phe	Pro	Pro	
			980					985					990			
Gly	Val	Pro	Val	Arg	Phe	Ser	Trp	Asn	Pro	Gly	Ile	Thr	Ala	Ala	Ala	
		995					1000					1005				
Ser	Pro	Thr	Phe	Pro	Glu	Ala	Asp	Gly	Thr	Phe	Ile	Gly	Gln	Leu	Leu	
	1010					1015					1020					
Ile	Leu	Ala	Lys	Asp	Gln	Thr	Gly	Pro	Arg	Thr	Ile	Thr	Ala	Ser	Gly	

1025		1030		1035		1040
Pro Gly Phe Ser Pro Val Lys Thr Asp Phe Leu Val Val Ser Gly Thr						
		1045		1050		1055
Val Gln Pro Pro Asp Gly Val Thr Arg Arg						
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Thr Cys Gly Ser Ala Thr																	
			20														

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			20														

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Tyr Cys Trp Ser Gly Cys																	
			20														

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Cys Tyr Thr Cys Ser Ala Cys
20

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1 5 10 15
Cys Ser Ser Trp Ser Ala
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 <210> 53
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Met Ser Gly Glu Phe

1

5